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The New international year book

THE NEW INTERNATIONAL YEAR BOOK

A COMPENDIUM OF THE WORLD'S
PROGRESS

FOR THE YEAR

1915

EDITOR

FRANK MOORE COLBY, M.A.

ASSOCIATE EDITORS

ALLEN LEON CHURCHILL

HORATIO S. KRANS, Ph.D.

NEW YORK

DODD, MEAD AND COMPANY

1916

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*Mrs. T. W. Richards
Cambridge*

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PREFACE

THE NEW INTERNATIONAL YEAR BOOK for 1915, the ninth in the new series which began with the 1907 volume, follows the same plan as its predecessors. That is to say, it is designed as an encyclopædia of the year, with the titles arranged in a single alphabet, and the text written anew each year. In the 1915 volume as in the one before, the effect of the war was to reduce the amount of available statistical information under certain heads. The space thus saved has been given to the comprehensive article on the WAR OF THE NATIONS, and to the many and diverse articles on subjects relating directly or indirectly to the war. The leading articles in this important group are: The WAR OF THE NATIONS, a clear and compact narrative by Professor Carlton Hayes, who wrote the corresponding article for the 1914 Year Book; UNITED STATES AND THE WAR, an impartial, explanatory record of the effects of the war on our foreign relations, by Professor Nelson P. Mead; supplementary articles on separate topics in the same field, such as LUSITANIA, PREPAREDNESS, INTERNATIONAL PEACE AND ARBITRATION (the last named by Mr. Clinton Rogers Woodruff); MILITARY PROGRESS, by Lieutenant Col. C. De Witt Willcox; NAVAL PROGRESS, SUBMARINES, and BATTLESHIPS, by Captain Lewis Sayre Van Duzer; AËRONAUTICS, etc., and also the biographies of persons brought into prominence by the events of the war. To aid the reader in following the year's fighting, color maps of the general fields of operation and sketch maps of the chief campaigns and battles are included.

Among the subjects treated the following may be mentioned: The field of fine arts, including MUSIC, the DRAMA, PAINTING AND SCULPTURE, ARCHITECTURE; LITERATURE, at home and abroad; the separate sciences and branches of learning, such as ASTRONOMY, CHEMISTRY, ZOÖLOGY, MEDICINE, PHYSICS, POLITICAL SCIENCE, POLITICAL ECONOMY, ENGINEERING, PHILOLOGY, PHILOSOPHY, etc.; articles on RELIGION, EXPLORATION, POLAR RESEARCH, Sports, Trade, Industry, and Business represented in such articles as BANKS AND BANKING, FINANCIAL REVIEW, INSURANCE, TRUSTS, LABOR, STRIKES, SHIPBUILDING, BUILDING OPERATIONS, etc.; gazetteer information under each of the States of the United States and the foreign countries; a series of biographies of men who have died during the year or who have been brought into prominence through public events; an historical record of the year's events under each foreign country as well as under UNITED STATES.

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ILLUSTRATIONS

	FACING PAGE
AERONAUTICS: CURTISS FLYING BOAT AND CURTISS MILITARY TRACTOR	4
ARCHITECTURE: BUILDINGS AT THE PANAMA-PACIFIC EXPOSITION, SAN FRANCISCO	46
BATTLESHIPS: UNITED STATES BATTLESHIP "OKLAHOMA"	80
BELGIUM: GENERAL VON BISSING AND MISS EDITH CAVELL	86
DAMS: TWO NOTABLE DAMS OF THE U. S. RECLAMATION SERVICE—ARROWROCK DAM AND ELEPHANT BUTTE DAM	174
DRAMA: EXAMPLES OF MODERN STAGECRAFT IN 1915	184
DRAMA: REVIVAL OF GREEK TRAGEDY IN AMERICA	186
ELECTRIC RAILWAYS: ELECTRIC LOCOMOTIVE FOR CHICAGO, MILWAUKEE AND ST. PAUL RAILWAY	198
EXPOSITIONS: SCENES AT THE PANAMA-CALIFORNIA EXPOSITION, SAN DIEGO	206
FINANCE: FOUR FINANCIERS OF THE GREAT WAR—BARON READING, KARL HELFFERICH, ALEXANDER RIBOT, REGINALD MCKENNA	214
FRANCE: FOUR FRENCH STATESMEN—THÉOPHILE DELCASSÉ, ARISTIDE BRIAND, GENERAL GALLIÉNI, RENÉ VIVIANI	234
GERMANY: GERMAN AND AUSTRIAN MINISTERS IN 1915—VON BETHMANN-HOLLWEG, ADMIRAL VON TIRPITZ, BARON BURIAN VON RAJEZ, VON JAGOW	262
GREAT BRITAIN: FOUR FIGURES PROMINENT IN GREAT BRITAIN—KEIR HARDIE, ADMIRAL SIR HENRY B. JACKSON, WINSTON CHURCHILL, EARL OF DERBY	284
GREECE: FOUR BALKAN STATESMEN PROMINENT IN 1915—M. VENIZELOS, M. SKOULOUDIS, M. RADOSLAVOF, TAKE JONESCO	292
ITALY: FOUR MEN PROMINENT IN ITALY IN 1915—ANTONIO SALANDRA, BARON SIDNEY SONNINO, PRINCE BERNHARD VON BÜLOW, COUNT LUIGI CADORNA	344
JAPAN: CORONATION OF THE MIKADO—COUNT OKUMA; SHINTO PRIESTS	350
LITERATURE: FOUR AUTHORS PROMINENT IN 1915—RUPERT BROOKE, EDGAR LEE MASTERS, CANON JAMES OWEN HANNAY, F. HOPKINSON SMITH	378
MILITARY PROGRESS: BUSINESS MEN'S MILITARY TRAINING CAMP AT PLATTSBURG	410
MILITARY PROGRESS: FRENCH SOLDIER EQUIPPED TO WITHSTAND POISONOUS GASES; GERMAN SOLDIERS USING MACHINE GUN	412
TURKEY: MILITARY LEADERS—FIELD MARSHAL VON DER GOLTZ AND ENVER PASHA	656
UNITED STATES: FOUR UNITED STATES SENATORS ELECTED IN 1915—R. F. BROUSSARD, T. W. HARDWICKE, P. O. HUSTING, CHARLES CURTIS	662
UNITED STATES: EX-SECRETARY OF STATE W. J. BRYAN, SECRETARY OF STATE ROBERT LANSING	668
UNITED STATES: FOUR REPRESENTATIVES PROMINENT IN 1915—CLAUDE KITCHIN, D. W. SHACKLEFORD, FRANK W. MONDELL, F. H. GILLET	670
UNITED STATES: FOUR MEN PROMINENT IN THE FOREIGN POLICY OF THE UNITED STATES IN 1915—WILLIAM J. STONE, HENRY P. FLETCHER, COLONEL EDWARD M. HOUSE, FRANK L. POLK	672
UNITED STATES AND THE WAR: REPRESENTATIVES OF THE TEUTONIC POWERS IN THE UNITED STATES—DR. BERNHARD DERNBURG, DR. KONSTANTIN THEODOR DUMBA, CAPTAIN FRANZ VON PAPEN, CAPTAIN KARL BOY-ED	678
UNIVERSITIES AND COLLEGES: FOUR EDUCATORS PROMINENT IN 1915—R. L. WILBUR, HENRY SUZALLO, REV. J. A. MULEY, S. J., EDWARD C. ELLIOTT	684
WAR OF THE NATIONS: FOUR RULERS OF BALKAN STATES: KING PETER OF SERBIA, KING FERDINAND OF BULGARIA, KING CONSTANTINE OF GREECE, KING FERDINAND OF RUMANIA	700
WAR OF THE NATIONS: TRENCH SCENES	702
WAR OF THE NATIONS: GERMAN EMPEROR AND GENERAL VON MACKENSEN—FORTIFICATIONS ON THE WEST BANK OF THE DVINA RIVER	710
WAR OF THE NATIONS: ITALIAN ALPINE TROOPS	718
WAR OF THE NATIONS: THREE BRITISH GENERALS PROMINENT IN 1915—SIR DOUGLAS HAIG, SIR CHARLES C. MONRO, SIR IAN HAMILTON	722
WASHINGTON, BOOKER T.	730

MAPS

AUSTRIA-HUNGARY	66
CHINESE REPUBLIC	142
ENGLAND AND WALES	278
NORWAY AND SWEDEN	464
RUSSIA	566
AFRICA	604
BALKAN STATES	654
EUROPE	698
WAR OF THE NATIONS—SKETCH MAPS OF FIELD OPERATIONS: ALLIES' LINE IN FRANCE AND BELGIUM, JANUARY 1, 1915	702
THE DARDANELLES CAMPAIGN	706
SECOND BATTLE OF YPRES, APRIL-MAY, 1915	709
BATTLE OF ARTOIS, MAY-JUNE, 1915	709
RUSSIAN BATTLE LINE, OCTOBER 1, 1915	715
FRENCH ADVANCE IN CHAMPAGNE	715
ITALIAN CAMPAIGN AGAINST GORITZ	718
MESOPOTAMIA AND ITS STRATEGIC POSITION	721

NOTE: Cross references in SMALL CAPITALS indicate that the allusion is to a separate article; cross references in *italics* denote that the reference is to a subdivision of a main article. A cross reference in *italics*, standing alone in an article, carries the reference to another subdivision of the same article. The letters q. v. (*quod vide* = Latin "which see") in parentheses following a word, indicate that the subject is treated under its own name elsewhere in the volume.

NOTE: In certain tables in this work it will be found, by addition, that the totals do not correspond to the sum of the items. This is the result of the omission or inclusion of certain small items which are not mentioned in the table, but are included in the totals. This is a usage frequently employed in the compilation of government statistics, from which sources the greater number of the tables in the YEAR BOOK are taken.

THE NEW INTERNATIONAL YEAR BOOK

A. B. C. PEACE TREATY. See ARGENTINA, section so entitled; BRAZIL, *History, Relations with Other South American Countries*; CHILE, *History, Chilean Relations with Foreign Countries*; and INTERNATIONAL PEACE AND ARBITRATION.

ABYSSINIA. An independent empire of eastern Africa. The area is estimated approximately at 432,000 square miles. The population consists of Semitic Abyssinians, Gallas and Somalis, negroes, Falashas, and non-natives—in all between 9 and 11 millions. Addis Abeba, the capital, has about 60,000 permanent inhabitants and a floating population of about 30,000; Harar, 40,000; Aksum, 5000; Diré Dawa, 5000. The Coptic Christian is the national church, and education is in the hands of Coptic teachers. The ruler is a Coptic Christian, but large numbers of his subjects are Mohammedans and pagans. Cattle and sheep raising and a primitive sort of agriculture are the main industries. The forests yield rubber and valuable timber. Gold-mining tracts extend along the banks of the Baro River, and coal has been found.

Imports through Jibuti in 1909, about £811,566; in 1910, £950,147. Exports by way of Jibuti average £335,000. Imports through Zeila, the Sudan, and Italian colonies, about £192,795 in 1909; exports average about £40,000. The total trade by way of Jibuti in 1911 was valued at 8,722,531 francs imports, and 11,765,844 francs exports; by way of Eritrea, 2,320,558 lire imports, and 3,072,100 lire exports; by way of Gambela in the Sudan, £E27,962 imports, and £E37,754 exports. A British source gives the total trade through Jibuti in 1912, imports and exports, at £588,924; imports through the Sudan £34,280 and exports, £38,720. The imports (chiefly from Great Britain, France, India, Italy, and the United States) are gray shirting, other cotton goods, arms and ammunition, foodstuffs, beverages, railway material, and petroleum. The exports are hides and skins, coffee, wax, ivory, civet, etc. A railway extends from Jibuti to Diré Dawa, a distance of 309 kilometers, of which 219 kilometers are in Abyssinian territory. An extension from Diré Dawa to Meheesso, 152 kilometers, was opened in 1913; the extension from Meheesso to Addis Abeba, 328 kilometers, is under construction. Telegraph lines connect the capital with Harar, with Jibuti, and with Massaua in Eritrea.

The government is essentially feudal in character, each large province being governed by a

ras, a prince or feudal chief, under an emperor whose power is absolute. Lij Yasu, born 1896, succeeded to the throne upon the death of Menelek II, Dec. 11, 1913. He is the son of Menelek's second daughter, Waizaro Shoa Röggä, and Ras Mikael, the chief of the Wollo Gallas. Menelek II (born 1844) had been emperor from 1889 until his death; but, owing to his incapacity, the government had been administered since 1910 by his grandson under the advice and direction of regents.

According to a statement made in December by Pierre Alype, a member of the Colonial Committee of the French Chamber of Deputies, the Emperor of Abyssinia had offered to furnish the Entente Allies with 200,000 troops whenever necessary.

ACADEMY, FRENCH (ACADÉMIE FRANÇAISE). The first to be founded (1635) and the most noted of the five academies constituting the Institute of France, the other four being: the Academy of Inscriptions and Belles-lettres, the Academy of Sciences, the Academy of Fine Arts, and the Academy of Moral and Political Science. The members of the French Academy, elected for life, and known as the "Forty Immortals," take rank as the leading Frenchmen of letters of their time; and collectively they are the last resort in all disputed literary matters. Fifteen hundred francs are given as a yearly honorarium to each member, and more than 12,000 francs are distributed annually in prizes. Two members, Alfred Jean François Mézières (q.v.) and Paul Hervieu (q.v.), died during 1915, leaving seven vacancies, which were not filled.

ACADEMY OF ARTS AND LETTERS, AMERICAN. A body of distinguished men, limited to 50, and selected from the membership of the National Institute of Arts and Letters. The Institute was organized at a meeting of the American Social Science Association in 1898. It was patterned in a general way after the French Academy. From its foundation in 1904, its president has been William Dean Howells. The Academy and the National Institute hold joint annual meetings, the last of which took place in Boston on Nov. 18 and 19, 1915. The gold medal of the academy was awarded to Dr. C. W. Eliot, ex-president of Harvard University. Since the last meeting in 1914 eight new members have been elected. On Nov. 24, 1915, the membership included: William Dean Howells, Henry James, Henry Adams, Theodore Roosevelt, John Singer Sargent, Daniel Chester French, John Burroughs, James Ford Rhodes,

Horatio William Parker, William Milligan Sloane, Robert Underwood Johnson, George Washington Cable, Andrew Dickson White, Henry van Dyke, William Crary Brownell, Basil Danneau Gildersleeve, Woodrow Wilson, Arthur Twining Hadley, Henry Cabot Lodge, Edwin Howland Blashfield, William Merritt Chase, Thomas Hastings, Hamilton Wright Mabie, Brander Matthews, Thomas Nelson Page, Elihu Vedder, George Edward Woodberry, Kenyon Cox, George Whitefield Chadwick, Abbott Handerson Thayer, Henry Mills Alden, George de Forest Brush, William Rutherford Mead, Bliss Perry, Abbott Lawrence Lowell, James Whitcomb Riley, Nicholas Murray Butler, Paul Wayland Bartlett, Owen Wister, Herbert Adams, Augustus Thomas, Timothy Cole, Cass Gilbert, William Roscoe Thayer, Robert Grant, Frederick MacMonnies, Julian Alden Weir, William Gillette, Paul Elmer More, George Lockhart Rives.

The first seven members were: William Dean Howells, Augustus Saint-Gaudens, Edmund Clarence Stedman, John La Farge, Samuel Langhorne Clemens, John Hay, and Edward MacDowell. William Milligan Sloane is chancellor and treasurer, and Robert Underwood Johnson, 52 Vanderbilt Avenue, New York City, is permanent secretary.

ACCIDENT INSURANCE. See **INSURANCE**; and **WORKMEN'S COMPENSATION**.

ACCIDENTS. See **RAILWAY ACCIDENTS**; **SAFETY AT SEA**; **WORKMEN'S COMPENSATION**; and **COAL, Accidents**.

ACCUMULATOR. See **ELECTRIC BATTERIES**.

ADAMS, CHARLES FRANCIS. An American soldier, publicist, and historian, died March 20, 1915. He was born in Boston in 1835. His father, Charles Francis Adams, was an American minister to England, and was the son of John Quincy Adams, and the grandson of John Adams. The son, Charles Francis Adams, was educated in a private school, and at Harvard College, from which he graduated in 1856. He studied law and in 1858 was admitted to the Massachusetts bar. At the outbreak of the Civil War he entered the service as a first lieutenant in the first Massachusetts Cavalry. He was promoted successively to be captain, lieutenant-colonel, and colonel of a regiment of colored cavalry, and was finally mustered out, and brevetted as brigadier-general of volunteers. After leaving the army, he entered the railway business, and gained a national reputation as an expert in traffic and administrative problems. He was a member of the Board of Railroad Commissioners of Massachusetts from 1869-79, and from 1877-90 he was director of the Union Pacific Railroad, and was president of the same road from 1884-90. Mr. Adams was best known, however, for his numerous important services to the public. He was chairman of the Commission which planned the Massachusetts Metropolitan Park System. From 1882-94 and again from 1895-1907, he was overseer of Harvard University. He was one of the foremost historical writers of the United States; had a remarkable grasp of political and economic problems; and was constantly in demand for lectures on political, economical, and historical subjects. Mr. Adams was bitterly opposed to the high tariff policy. Much of his historical work had to do with the Civil War. He greatly admired General Lee, and wrote much

about him. It was he who suggested that a monument of General Lee be erected in Washington. Mr. Adams's brothers, Brooks and Henry, are both well known historians. He was a member of many learned societies. His published writings include: *Chapters on Erie and Other Essays* (written with his brother, Henry Adams, 1871); *Railroads, their Origin and Problems* (1878); *Notes on Railway Accidents* (1879); *Massachusetts, Its Historians and Its History* (1893); *Life of Charles Francis Adams* (1900); *Richard Henry Dana, a Biography* (1891); *Lee at Appomattox and Other Papers* (1902); and *Studies Military and Diplomatic*. He received the degree of LL.D. from Princeton University in 1895.

ADAMSON, ALFRED. A rear admiral retired of the United States navy, died Feb. 23, 1915. He was born in Brownville, New York, in 1838. In 1861 he was appointed third assistant engineer, United States navy, and he passed through successive steps of promotion until he became chief engineer in 1879. He was retired on account of age in 1898. In 1906 he was advanced to the rank of rear admiral retired in recognition of his Civil War services.

ADDAMS, JANE. See **WOMAN MOVEMENT**.

ADEN. A British possession in Southwestern Arabia, forming a part of the Bombay Presidency of British India. It consists of a peninsula and a small strip of coast. Area, 75 square miles, or with the Island of Perim 80 square miles. Population in 1911, 46,165, as compared with 43,974 in 1901. A territory extending inland from Aden, about 9000 square miles in area, is under British protection; estimated population, about 100,000. The town of Aden is strongly fortified and constitutes an important coaling and transshipment station. Except the small quantities of exports and imports to and from Arabia, the trade is almost wholly transit. In 1913-14 imports of private merchandise by sea were valued at £3,756,964; by land, £170,213; imports of treasure, £450,305. Private exports by sea in that year, £3,267,283; by land, £140,159; exports of treasure, £741,687. The leading imports by sea are cotton goods, grain, hides and skins, and tobacco. The exports by sea include these articles together with coffee, gums, civet, and wax. In 1913-14 there were entered at the port of Aden 1529 merchant vessels, of 3,925,044 tons. Aden is subject to the government of Bombay and is administered by a resident, who is also commander of the troops in the garrison. Administratively attached to Aden, besides Perim, are Socotra and the Kuria Muria islands.

In the course of the **WAR OF THE NATIONS** (q.v.) an attack was made on Aden by the Turks. Having occupied Lahej in July, the Turkish troops advanced to Sheikh Othman in the near vicinity of Aden and menaced the fortress of Aden. The British garrison successfully repulsed the attack, according to the statement given out in December by the British India Office, and only insignificant skirmishes occurred thereafter. The operations around Aden were considered of great importance, inasmuch as the capture of the town by the Turks would imperil the main line of communication between England and her Asiatic colonies.

ADICKES, FRANZ. German public official, died Feb. 4, 1915. He was born in 1846. For many years he was mayor of Frankfort, and

owing to his activity in municipal Socialism was one of the most prominent civic officials in Germany. Perhaps his most notable achievement was the establishment of the University of Frankfort in 1914. See **UNIVERSITIES AND COLLEGES**. He resigned as mayor of Frankfort in 1912.

ADULTERATION. See **FOOD AND NUTRITION**, *passim*.

ADVANCEMENT OF SCIENCE, AMERICAN ASSOCIATION FOR THE. The 67th annual meeting of the association was held in Columbus, Ohio, Dec. 27, 1915, to Jan. 1, 1916. There were 750 members in attendance. At the same time the following societies affiliated with the Association held their meetings: American Association of Economic Entomologists; American Mathematical Society; American Microscopical Society; American Nature Study Society; American Physical Society; American Phyto-pathological Society; American Society of Naturalists; Association of Official Seed Analysts of North America; Botanical Society of America; Entomological Society of America; Society for Horticultural Science; Southern Society for Philosophy and Psychology; Students and Collectors of Ohio Archaeology; Wilson Ornithological Club. The opening meeting was held in the college chapel of the Ohio State University, over 1200 persons being present. The total number of registered members of the association was 750. Dr. Charles W. Eliot, the retiring president, gave an address on "The Fruits, Prospects, and Lessons of Recent Biological Science." Three public lectures were delivered: by Dr. Douglas W. Johnson, on "Surface Features of Europe as a Factor in the War"; Dr. Raymond F. Bacon, on "The Industrial Fellowships of the Mellon Institute"; and Dr. Frank K. Cameron, on "The Fertilizer Resources of the United States." The council of the association decided that members of the affiliated societies not now members of the American Association be invited to join it in 1916 without payment of the usual entrance fee. The following officers were elected: President, C. R. Van Hise; vice-presidents—mathematics, L. P. Eisenhart; physics, H. A. Bumstead; engineering, E. L. Corthell; geology and geography, R. D. Salisbury; zoölogy, G. H. Parker; botany, T. J. Burrill; anthropology and psychology, F. W. Hodge; social and economic science, Louis I. Dublin; education, L. P. Ayres; agriculture, W. H. Jordan. W. E. Henderson was elected general secretary, and C. Stuart Gager secretary of the council. The Pacific Coast meeting of the association, held in connection with the Panama International Exposition, took place in San Francisco during August 2-9. The president, W. W. Campbell, gave an address on "Science and Civilization." Three public evening addresses were made, respectively, by R. A. Daly, W. B. Scott, and P. S. Reinsch. Over 90 sessions of the association were held during the week. The total registered attendance of members was 606.

ADVANCEMENT OF SCIENCE, BRITISH ASSOCIATION FOR THE. The annual meeting of the association was held at Manchester in the early part of September. The number of members and associates (1438), although not disappointing, considering the war, was small as compared with previous meetings. The reception by the Lord Mayor in the School of Technology on Wednesday evening was the only general social function

of the week. The citizens' lectures given in Manchester and other towns in the neighborhood attracted large audiences. They were on the following subjects: "Education and War," by Prof. F. W. Gamble; "The Strategic Geography of the War," by Dr. Vaughan Cornish; "The Making of a Big Gun," by Dr. W. Rosenhain; "Daily Uses of Astronomy," by A. R. Hinks; "Health Conditions in the Modern Workshop," by Prof. B. Moore; "Formation of the Sun and Stars," by Rev. A. L. Cortie; "Some Lessons from Astronomy," by Prof. H. H. Turner; and "Curiosities and Defects of Sight," by Dr. W. Stirling. Grants of money amounting to £968 were appropriated for scientific purposes on behalf of the general committee to members in the following sections: Mathematical and physical science, chemistry, geology, zoölogy, geography, economic science and statistics, engineering, anthropology, physiology, botany, and education. Notable addresses were made during the meeting by Sir Thomas H. Holland, on "The Organization of Science"; Prof. W. M. Bayliss, on "The Physiological Importance of Phase Boundaries"; Mrs. Henry Sidgwick, on "Educational Science"; Prof. Grenville Cole, on "Geology"; Major H. G. Lyons, on "The Importance of Geographical Research"; Dr. H. S. Hele-Shaw, on "Organization to Meet German Competition at the End of the War"; and Prof. Charles G. Seligman, on "The Early History of the Anglo-Egyptian Sudan from the Point of View of the Ethnologist." The next meeting will be held at Newcastle.

ADVENT CHRISTIANS. See **ADVENTISTS**.

ADVENTISTS. The largest branch of the denomination, the Seventh Day Adventists, had in the United States at the close of 1914, 68,203 communicants, 1913 churches, and 528 ministers. The members of the denomination contribute for evangelistic work about \$3,000,000 annually. Of this amount about 60 per cent is raised in tithes, which is the main source of revenue. The church buildings and property are valued at about \$13,000,000. There are nearly 800 schools with an enrollment of about 30,000. The denomination maintains 37 publishing houses and branches under its control. Over 1600 missionaries are maintained in 67 different countries. About \$1,000,000 is expended in the support of this work. The other branches of the denomination are the Advent Christians, with about 26,000 communicants, 550 churches, and 528 ministers; The Church of God, with about 600 communicants, 20 churches, and 32 ministers; The Life and Advent Union, with 509 communicants, 12 churches, and 12 ministers; and The Church of God in Jesus Christ, with 2224 communicants, 68 churches, and 61 ministers.

ÆGEAN ISLANDS. See **GREECE**.

AERONAUTICS. The year 1915 marked the point where the construction of aeroplanes passed beyond the experimental stage and became an industry. Every detail of their structure and equipment was tested in the great war. The raids of the Zeppelins, largely futile and causing little damage, the destruction of men and property, the various services on the Continent rendered by the aviators of the fighting armies, and the actual combats between air craft, were all features of the great war which will be found discussed elsewhere in the **YEAR BOOK** under **WAR OF THE NATIONS**, **NAVAL PROG-**

RESS, and MILITARY PROGRESS. Naturally the military developments led more to wholesale manufacture than to experimentation, which, when it did take place, was practical rather than scientific. The details of new work and actual construction and performance, so far as the belligerent countries are concerned, are meagre and unreliable. In the United States the manufacture of aeroplanes vastly increased, and by the close of 1915 America was reported to be the largest manufacturer of aeroplanes and their parts, its sales being estimated at almost \$5,000,000.

The result of this activity was the organization of large factories by American manufacturers either in the United States or in Canada. Thus, the Curtiss Company at the end of the year was occupying a large plant in Buffalo, and was said to have contracts for about \$15,000,000 worth of aeroplanes, to be able to turn out daily a complete *America*, the largest size of aeroplane, and to be preparing to turn out daily five so-called *Canadas*—this in addition to the wholesale manufacture of the standard types of the concern. The Wright Aeroplane Company of Dayton, Ohio, changed hands and was capitalized at \$5,000,000. Other works in the United States were the Glenn L. Martin Company, of Los Angeles, the Sturtevant Aeroplane Company, of Massachusetts, the Burgess Company, of Marblehead, Mass., the Thomas Company, of Ithaca, N. Y., and a large number of smaller concerns which were getting ready for increased business.

Many of these manufacturers and aeroplane engineers late in December assembled in conference with members of the Naval Consulting Board and the Society of Aeroplane Engineers to consider the standardization of aeroplanes on a basis similar to that followed so successfully in the American automobile industry. It was urged at this meeting that there be engineering coöperation and standardization of materials, designs, and methods of specification and test, and it was the sense of the various representatives at the conference that the adoption of suitable standards would lay a real commercial foundation for the aeroplane industry in America for future years. Committees of the Society of Aeroplane Engineers were appointed to consider the problems of nomenclature and standardization, and these committees were to work in harmony with the engineers of the army and navy.

Gradually the size and strength of aeroplanes had increased, and machines were constructed by the fighting nations in Europe on a scale that probably never would have been attempted in more pacific times. Biplanes and triplanes spreading over 100 feet were in service, and were being built, while power plants in duplicate and triplicate were being installed on these as well as on smaller machines. One German triplane was stated to have eight Maybach motors coupled in pairs, each pair driving one of four propellers, two of which will drive the plane under ordinary conditions. Provision was being made for larger crews, of six or more men, 20 in the German machine just mentioned, and the weight of bombs, ammunition, fuel, and provisions was far in excess of the most sanguine hopes entertained by designers and aviators a few years previously. In addition much attention was paid to stabilizing, and military

machines were being better equipped with various adjuncts that would relieve the pilot of strain and effort, and better enable him to observe, reconnoitre, drop bombs, or engage in offensive combat with other craft. In the best military aeroplanes the aviator's hands and feet could be taken off the controls long enough for the aviator to use a camera, release a bomb, examine or mark a map, or aim and fire a rifle or pistol.

The year's progress in engine construction was largely towards more powerful plants. Many 12-cylinder engines were being made in sizes ranging from 100 to 250 horse power, and it was observed that the stationary cylinder type was in many places supplanting the rotary engine which previously had the preference. The stationary cylinder engine was found more simple, easier to repair, and of greater reliability, following as it did lines laid down by automobile designers.

In America, Great Britain, France, and Germany, the type favored was the twin-six with stationary cylinders of the V form. The motor with stationary cylinders demonstrated itself as the most efficient, and in fact such an engine of the stationary water cooled type was used in the duration record flight of 24 hours made in 1914 by Reinhold Boehm. Of course for military aviators record breaking was not so much an object as reliability and great horse power to carry the weights—observers, bombs, and other apparatus—required. The V-type motor also showed economy in fuel consumption and a greater radius of action, while in its larger size it had less weight and less bulk than the vertical cylinder engine, and might offer less resistance to the air in flight. The twin-six or twelve-cylinder V-type of motor seemed to be not only a development but the accepted form during the year 1915, and many authorities thought that the 8-cylinder motor would be supplanted by the 6- or 12-cylinder motor, as the latter balanced better, had more torque, and ran smoother.

In France, the Renault Company, which developed an air-cooled 12-cylinder motor of 100 horse power, was manufacturing these machines at the Schneider Automobile Works at Lyons and elsewhere, so that about ten motors a day were turned out for government use, while England, the United States, and other countries were using these motors experimentally. In Great Britain, a notable engine development during the year was the British *Sunbeam*, a 12-cylinder V-type motor built for the great fighting biplanes of the Royal Air Craft Factory. This motor weighed 1085 pounds complete, was water cooled, and could develop 225 horse power. Two such motors were installed on one of the big tractor biplanes which had a wing spread of 70 feet. The motor had a speed of 2000 revolutions per minute, which was reduced to 1000 revolutions for the propeller. Another British engine, somewhat lighter, was built for British experiment by the Rolls-Royce Company, which was a twin-six of 250 horse power and weighed 800 pounds, while a number of American motors were being tested by the British government at the Royal Air Craft Factory at Farnborough.

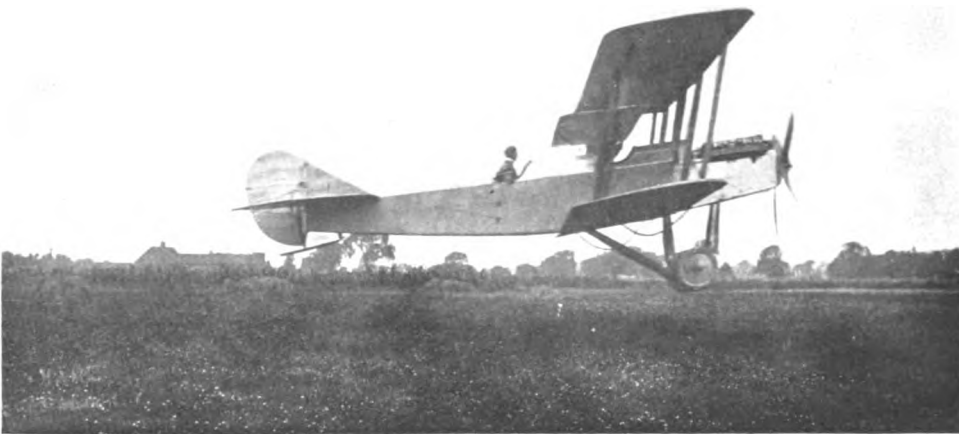
Among other engines brought out in 1915 was a 12-cylinder V-type water cooled motor weighing 720 pounds, designed by L. E. Rausenberger,

AERONAUTICS



CURTISS FLYING BOAT

A machine of this type made a long distance flight of 554 miles in 10 hours



CURTISS MODEL "R-2" MILITARY TRACTOR

A type of machine made in America and supplied to the armies of the allies. In 1915 it made a notable flight from Toronto to New York, and with three passengers in addition to the pilot made an altitude record of 8024 feet

and planned to give 150 horse power at a normal speed of 120 revolutions per minute. The cylinders are staggered so that the connecting rods of opposite cylinders are placed side by side on the same crank pin. Another notable engine, the Ashmussen 105 horse power motor, water cooled, with cylinders horizontally opposed and weighing 345 pounds, was being developed during the year. The bore and stroke were 3.75 inches and 4.5 inches respectively. Another 12-cylinder motor of the year was the Johnson 2-cycle type of the 90° V-form with a bore of 5 inches and a stroke of 4 inches, with a rating of 150 to 180 horse power, at a speed ranging from 1150 to 1400 revolutions per minute. This engine weighed 598 pounds.

While extensive manufacturing work was being carried on, at the same time the mechanical engineering features were investigated, and Prof. Charles E. Lucke, of Columbia University, was testing modern aeroplane engines for the National Aeroplane Advisory Board, and it was hoped that there would be a contest for aeroplane motors to be held by the United States navy, in which a large number would receive exhaustive scientific tests.

MISCELLANEOUS DEVELOPMENTS. In the various machines turned out during the year from the Curtiss works in Buffalo a number of technical advances were to be noted. In one machine built specially for war purposes, and capable of carrying three passengers besides the pilot, tested during the summer, an American record for climbing with considerable weight was made, as well as a capacity of great speed in ordinary flying demonstrated. With two passengers, an ascent of 8200 feet was made in 27 minutes, and with three passengers a considerably greater elevation was attained in a proportionate time. Here the total live load was 800 pounds and 8300 feet was reached when the barograph ceased recording, and the ascent was continued for another five minutes. The American record for height with two passengers previous to this was 5187, and the world's record with three passengers, 15,650 feet, was made by an Austrian aviator in 1914. This Curtiss machine was of the tractor type where the passengers were placed in a cockpit in front of the pilot, who is located behind the planes. The 160 horse power engine was capable of carrying a load of 1500 pounds dead weight. The control of the machine was said to be perfect and a speed of 94 miles an hour was made without the pilot's touching the wheel.

At the end of the year there was building at the yard of the Curtiss Company of Buffalo what was considered to be the largest and most powerful flying boat aloft. This craft was a development of the *America* which was designed and constructed to cross the Atlantic in 1914, and which was discussed in the 1914 YEAR BOOK. The *America* late in 1914 was purchased by the British Admiralty, and was put in commission with the Coast Defense Aeroplane Squad in connection with the troop transports crossing the English Channel, as she was able to warn such craft against submarines, and it was stated that she destroyed three German submarines and prevented attacks on British transports in the Channel. Accordingly the British Admiralty gave orders during the year, first for 12 and then for 20 flying boats of the *America* class, as they seemed a

most practical defense against submarines, inasmuch as they had a much greater speed and a deep sea vision, so that they could hunt down the submarines and either capture or destroy them with their own bombs, or indicate their position to the protective fleet of fast motor boats.

This battleship aeroplane, as it was termed, building at the end of the year 1915 at the Curtiss Company, was a triple screw triplane weighing, fully equipped, 21,450 pounds. It had a hull of cedar planking, sheathed with copper on the under side and riveted to stout ash ribs. The boat was 68 feet long, with a beam of 20 feet. It had a V-shaped bottom ending in a straight stem forward, while its rear was cut off sharply, so as to facilitate rising from the sea. The lines of the hull were carefully developed in the light of marine experience, and the hull itself was divided into 12 water-tight compartments, one-third of which could keep the machine floating should the hull be pierced and several compartments flooded. The boat contained a conning tower for the control apparatus and the navigating instruments, a cabin for the crew of eight, containing the fuel tanks, ammunition, and stores. The fuel supply was 700 gallons of gasoline, 80 gallons oil, sufficient to give the machine (at a speed of 75 miles an hour) a cruising radius of 675 miles. The superstructure consisted of three supporting planes, with a span of 133 feet, and a chord of 10 feet, with a gap of 10 feet between each two planes, the total area of support being about 4000 square feet. The tip of each lower wing was fitted with a pontoon to prevent digging into the water when running on the surface or when at anchor. The propelling engines consisted of six 160 horse power water cooled V-type engines, which were coupled in twin units of 320 horse power, each unit driving an air screw about 15 feet long. One unit was placed amidships and drove a central pusher screw, and the two others were mounted on the edges of the centre plane on either side and above the cabin, so as to drive a tractor air screw. There was an electric starter auxiliary engine of 40 horse power which generated the current required for the automatic stabilizer, the drift indicator, and the minor apparatus. This auxiliary engine also drove a water propeller for water navigation.

This new flying boat took into consideration every device known for safety and for the remote contingencies of engine failure, as with even one engine running the pilot could climb out of reach of gun fire as well as keep on any desired course. The steering apparatus consisted of a balanced rudder of 54 square feet area, with a keel-fin of 46 square feet area. Longitudinal stability was secured by a tail-fin of 126 square feet area, and an elevator of 96 square feet area. Transverse stability was provided by interconnected ailerons hinged to supporting planes. Nothing definite was revealed as to the armament of this flying boat, but it was stated that it was possible that even a six-pounder might be carried in place of the usual one and one-half pound aircraft gun. While American authorities were not entirely conversant with the most recent practice of European design and construction, yet it was believed that the Curtiss triplane represented a recent and extraordinary development.

On Dec. 12, 1915, a test was made at Readville, Massachusetts, by Lieut. B. Q. Jones, United States army, of an all steel battleplane designed by Grover C. Loening. This machine was a biplane with a wing spread of 65 feet over all. The frame work was of vanadium steel, affording unusual strength, standardized and stamped out by machinery, so that perfect interchangeability and ready repairing were insured should the machine become successful as a type. This consideration was followed throughout the design and construction, as the planes were built up in such a way that any one of the sections could be altered subsequently to secure changes and improvements without impairing the usefulness of the whole, while in case of damage an impaired section could be removed and replaced readily. The engine was a 100 horse power motor, with a propeller mounted in front, and adequate to give a speed of 90 to 95 miles per hour, while the fuel tanks had a capacity for a flight of 800 miles. On its military side an interesting feature was mounting two gun turrets at the tips of the plane, so that a vertical arc of over 90° and a horizontal arc somewhat over 200° could be covered. In times of peace the space devoted to the gun turrets could be used for baggage compartments. About 500 pounds thus could be transported.

The Giant Sikorsky aeroplane developed in Russia rendered important service during the war. This machine it will be recalled could carry 20 passengers for 15 or 20 hours while running at a minimum speed of about 60 miles an hour. This machine was in service for military duty along the Galician front for bombardment and fire control, and was driven by four Salmson motors of 500 horse power. The steel frame of this aeroplane was 66 feet in length and it contained an enclosed cabin, the dining-room of the original ship having been transformed into a munitions magazine.

FLIGHTS. One of the important flights of the year in America was by Victor Calstron, a Curtiss aviator, who flew from Toronto to New York, making a detour to skirt the western end of Lake Ontario, passing over Buffalo at an altitude of 6000 feet, and following the Lackawanna Railroad to Binghamton, where he alighted. On the second portion of the journey he followed the Erie to New York and landed in the Jersey meadows. This flight was accomplished with a Curtiss military tractor biplane of the R-2 type, equipped with one of the new 160 horse power Curtiss motors.

In the latter part of October a competition was held for the Curtiss Marine Flying Trophy, and the best record was made by Oscar A. Brindley, who was in the air from 6.20 o'clock in the morning of October 27th until 4.20 in the afternoon of the same day, making an estimated mileage of 554 miles. Mr. Brindley traveled without passengers and flew over a circuit course from whose extent according to the rules of the competition 5 per cent was to be deducted. There were 12 entrants for this competition, representing five different aero clubs. The prize was \$1000. Brindley was an instructor in the United States Signal Corps Aviation School at San Diego, Cal., and used a Martin military 90 horse power V-type motor.

RECORDS. With the leading European aviators engaged in military operations it was not

strange that there should have been in Europe no important contests during 1915. In America, however, a number of new records were made, the most important of which were as follows: *Duration:* Aviator alone, Lieut. Byron Q. Jones, United States army, January 15, 8 hours, 53 minutes; aviator and two passengers, Lieut. Byron Q. Jones, United States army, March 12, 7 hours, 5 minutes. *Altitude:* Aviator and one passenger, Lieut. J. E. Carberry, United States army, January 5, 11,690 feet; aviator and two passengers, R. V. Morris, August 10, 8024 feet; aviator and three passengers, August 10, 8105 feet. *Distance for Hydro-Aeroplanes:* Aviator and one passenger, Lawrence B. Sperry, January 20, 60 miles. *Duration for Hydro-Aeroplanes:* Aviator and one passenger, Lawrence B. Sperry, January 20, 1 hour, 25 minutes. *Altitude for Hydro-Aeroplanes:* Aviator alone, Lieut. P. N. L. Bellinger, United States navy, April 23, 10,000 feet; aviator and one passenger, Lieut. H. Ter Poorten, August 31, 8330 feet.

FATALITIES. Had it not been for the European War, the list of fatalities would have been much smaller than usual. Naturally, a number of belligerent aviators were killed. The list included the famous French flyer, Alphonse Pegoud, killed in August. In the United States, Lincoln Beachey, an intrepid aviator, was killed at the Panama-Pacific Exposition on March 14th. Among other fatalities were: Cecil M. Peeli, killed while testing a new Grant biplane for the United States army at College Park, Md.; Ensign Melville M. Stolz, United States navy, killed on May 8th at Pensacola, Fla.; Captain George H. Knox, United States army, killed at Fort Sill, Okla., August 12th; Donald Gagon, killed at Erie, Pa., August 17th; and Lieut. W. K. Taliaferro, killed at San Diego, Cal., October 11.

See also **MILITARY PROGRESS.**

AEROPLANE. See AERONAUTICS.

AFGHANISTAN. A monarchy of central Asia. Estimated area, about 225,000 square miles. The number of inhabitants cannot be stated definitely, but a plausible estimate puts it at about 5,000,000. The population of Kabul, the capital, is estimated at from 150,000 to 180,000; the city of Kandahar is supposed to have upwards of 40,000 inhabitants (one estimate is as high as 80,000), and Herat about 20,000. The Afghans, who are more or less turbulent tribesmen, belonging mostly to the Mohammedan Sunni sect, engage in both grazing and agriculture, producing for export cereals, lentils, fruits, live animals, wool, hides, and zhi. Silks, felts, carpets, and camels' hair goods are produced to some extent and exported. In the fiscal year 1913 (according to British Indian figures), imports of merchandise from Afghanistan in British India amounted to £847,656, and exports of merchandise from British India to Afghanistan, £1,666,802; in 1913-14, £860,000 and £1,013,000. Imports to Afghanistan from Bokhara are supposed to amount to about 4,000,000 roubles, and exports the same. Taxation is attended with dishonesty and extortion. At the head of the loosely organized government is the ameer (Habibullah Khan since 1901), whose annual revenues probably exceed 13,000,000 rupees: from the Government of India he receives an annual subsidy of 1,800,000 rupees. Afghanistan is in the sphere of British

influence, having by treaty no foreign relations except with the Government of India.

AFRICA. See articles on the various African countries; **ANTHROPOLOGY**; **ARCHÆOLOGY**; **EXPLORATION**; and **PEABODY MUSEUM**.

AFRICAN METHODIST EPISCOPAL CHURCH. See **METHODISTS**, **COLORED**.

AGLIARDI, ANTONIO. Roman Catholic Cardinal, died March 20, 1915. He was born at Cologno in 1832. After he had served as parish priest in his native town for twelve years he was sent to Canada as a bishop's chaplain, and on his return was appointed secretary to the Propaganda. Pope Leo XIII created him Archbishop of Caesarea in 1884 and in the same year and in 1887 he was sent on missions to India. In 1887 he was appointed secretary to the Congregation, and in 1889 Papal Nuncio at Munich, and was transferred to Vienna in the same capacity in 1892. The Hungarian government complained in 1895 that he was taking part in the ecclesiastical disputes which were dividing the country, and in the following year he was recalled, and elevated to the rank of cardinal, becoming the titular bishop of Albano. At the time of his death he was sub-dean of the Sacred College.

AGRICULTURAL BANKS. See **AGRICULTURAL CREDIT**; and **BANKS AND BANKING**.

AGRICULTURAL COLLEGES. See **AGRICULTURAL EDUCATION**.

AGRICULTURAL CREDIT. The very marked interest which has been shown during the past few years in proposals for facilitating loans to farmers continued during 1915. This was shown by the unusual volume of legislation on the subject. Various phases of the problem were considered at the annual session at Chicago of the National Conference on Marketing and Farm Credits. In Congress the Senate passed a bill establishing a bureau for lending to farmers \$10,000,000 to be appropriated from public funds and additional sums to be derived from the sale of government bonds. The House passed a bill creating land banks to make loans to farmers, funds to be derived from bonds backed by the government, but based on farm mortgages. This bill authorized the Secretary of the Treasury to purchase \$50,000,000 worth of these bonds yearly. Both of these proposals failed since the two Houses did not agree. The great volume of legislation led to protests by former Ambassador to France Myron T. Herrick and other leading students of the problem against hasty legislation which involved the pledging of government credit for the promotion of private business. Mr. Herrick pointed out that bad crops or financial depression might so involve the credits of State governments as to force heavy losses on the taxpayers. The line of sound progress he believed was not in the direction of State aid but rather through coöperation.

PROPOSED CONGRESSIONAL ACTION. A new bill believed to express the administrative viewpoint was completed by a sub-committee of the joint Congressional Committee on Rural Credits on December 24th, and was to be presented to that committee in January by Senator Henry F. Hollis. It combined features of the Hollis-Buckley Bill considered earlier in the year and the Fletcher-Moss Bill approved by the United States Commission on Rural Credits. It provided for a Federal Land Bank Board of five members to supervise 12 regional land banks

each with a capital stock of \$500,000. Each regional bank would make loans to farmers through local coöperative farm-land associations or joint-stock banks. The regional banks would obtain additional funds by selling bonds; and the charge to the farmer would be the interest on such bonds plus 1 per cent. These bonds would be backed by the regional banks, the local associations, the borrowing farmers, and the mortgages on their lands. Repayments of the loans would be by annual installments during not more than 36 years.

THE NATIONAL CONFERENCE ON MARKETING AND FARM CREDITS was held at Chicago, November 29-December 2, in conjunction with the National Council of Farmers' Coöperative Associations, the National Farmer's Union, the National Grange, and various State branches of the American Society of Equity. The general subjects, each treated by several speakers, were: the organization of agricultural coöperation; the standardization of farm products; standards and uniform packs, with special reference to the cotton problem; rural credits with special reference to land purchase; standardization and marketing with special reference to grading and inspection; financing farm business; and marketing the farm product.

THE FARM MORTGAGE BANKERS' ASSOCIATION OF AMERICA met in annual convention at St. Louis in October. All phases of the rural credit situation were discussed, and the board of governors of the association devoted considerable time to the formulation of suggested laws and of recommendations to the Joint Congressional Committee on Rural Credits.

FEDERATION OF JEWISH FARMERS OF AMERICA. This organization held its seventh annual convention at New York in December. It started in 1909 with 13 associations, and in 1915 had 84 branches in a dozen States. It carries out a coöperative purchasing plan which during these years has handled more than \$225,000 of business, with a saving of at least \$25,000 to the farmers. At the same time it has educated its members in the use of better seeds, fertilizer, and machinery. With it is associated the Jewish Agricultural and Industrial Aid Society which forms credit unions. In 1915 there were 19 such unions in four States with aggregate loans of \$210,292. These were the pioneer rural credit associations in this country and were modeled after the German societies. These organizations were instrumental also in forming coöperative fire insurance companies in New York and New Jersey. These had issued 555 policies covering \$1,185,000 insurance. The Federation had also established an agrarian bank in Sullivan County, N. Y., a coöperative creamery, and had carried out coöperative marketing plans.

LEGISLATION. The extensive agitation of the past few years has led to the enactment of considerable legislation by the States. The first law designed to facilitate the establishment of credit for farmers was a Massachusetts law of 1909 authorizing credit unions. Texas and Wisconsin in 1913 and New York in 1914 also authorized rural credit unions or coöperative credit associations and the Land Bank of the State of New York. But in 1915 more advanced steps were taken through the organization of competitive farm land banks under State supervision in Massachusetts, Utah, and Wisconsin.

sin; in Missouri, Montana, and Oklahoma systems of State loans were established; Massachusetts enacted further legislation regarding credit unions and coöperative banks, while North Carolina, Oregon, and Utah also authorized the organization of credit unions and coöperative banks. Bills for the creation of farm land banks were defeated in California, Indiana, Iowa, Michigan, and Nebraska. In Kansas and North Carolina building and loan associations were authorized to make long-term loans on farm lands. California created a commission to investigate rural credit schemes both at home and abroad. There was other legislation indicating the variety of proposals brought forward. Wyoming authorized the State treasurer to invest in irrigation bonds certain funds arising from the sale of State lands; in the same State a bill authorizing the investment of permanent funds of the State in farm mortgages failed of passage; in North Carolina a proposed amendment to the constitution authorized the State to create a loan fund the credit of which may be placed to individual farmers or credit associations; Montana authorized the State treasurer to issue bonds and from the proceeds make long-term loans to farmers secured by first mortgages, the administration to be carried out through county treasurers, and prompt payment of interest on the State bonds being insured by a guarantee fund provided by the State; Missouri and Oklahoma likewise authorized the use of certain State funds as initial capital for a system of long-term loans. Thus in Oklahoma a fund of \$2,000,000 was set aside to be loaned to farmers on mortgages of twice the value of the loans. An annual payment of 8 per cent of the principal was to cover interest and also amortize the principal in 23½ years.

The Missouri law establishing a land bank may be described to illustrate this type of institution. This bank is to be under the immediate administration of the State Bank Commissioner and a board of governors. Its initial working capital is \$1,000,000 appropriated from the funds in the State treasury. One-half of this may be loaned to farmers on the basis of deeds of trust at a net interest rate of 4.3 per cent. Thereafter additional capital will be secured through the sale of debenture bonds in series of \$500,000, the interest rate to the farmers being equal to that of the bonds. Loans to farmers are based on deeds of trust of 50 per cent of the appraised value of their farm lands; the entire State is to be appraised by expert appraisers and the bonds issued will not exceed the deeds of trust or 50 per cent of the appraised value of the land upon which loans are based. Whenever deeds of trust to the value of \$500,000 have accumulated a new series of bonds may be issued. The loans to individual farmers range from \$250 to \$10,000 and for terms of not less than 5 nor more than 25 years and an amortization scheme provides for the repayment of principal in fixed annual payments. The Missouri law does not become operative until Dec. 1, 1916. Meanwhile a referendum is authorized to determine the constitutionality of the appropriation of State funds for this purpose.

The Land Bank of New York was patterned after the Landshaft system of Germany. A large number of savings banks and loan associations with total assets of \$20,000,000, furnished the local basis for its operations. The

first bond issue of \$250,000 was to mature in 10 years and bore interest at 4½ per cent. The plan includes the sale of these bonds to investors and large financial institutions and the loaning of the proceeds to member associations at 5 per cent. Through these latter the funds reach the farmers in exchange for mortgages which become the basis in turn for further issues of bonds. The experience of the first year under this new organization showed that the greatest difficulty was not in bringing into existence the financial basis for farm loans but in arousing the interest of the farmers in taking advantage of the new scheme.

Bibliography. The most notable publication on this subject was Herrick and Ingalls's *Rural Credits* (1914), being a comprehensive account of European experience and new developments in America. The United States Department of Agriculture reprinted *Coöperative Credit Associations in Certain European Countries and Their Relation to Agricultural Interests* by Edward T. Peters, first prepared in 1892. See also **BANKS AND BANKING.**

AGRICULTURAL EDUCATION. The year 1915 marked considerable progress at the agricultural colleges of the United States, in their physical equipment, the development of their courses, and the strengthening of the teaching forces. Several of the colleges, notably Oklahoma, Oregon, and Utah, increased their entrance requirements to 15 or 16 credits, thus enabling a higher grade of college work. New courses were added for the preparation of agricultural teachers and for extension workers. The Utah Agricultural College celebrated its twenty-fifth anniversary in June with special exercises and a historical pageant.

The number of new buildings completed or under way was unusually large. At the University of California an additional building of the agricultural group, to cost \$250,000, was started. At the Iowa State College a plant industry building, of the same general type as the Hall of Agriculture previously built, was under construction. One of its wings was to provide for horticulture, landscape gardening, etc., and adjoining the building a range of greenhouses covering about half an acre were to be provided. Stockbridge Hall, a new agricultural building at the Massachusetts Agricultural College, costing with equipment \$210,000, was dedicated in October. It was the largest and finest building on the college campus.

In Nebraska, the Legislature provided \$700,000 for the erection and equipment of agricultural buildings during the ensuing four years. The erection of a new dairy building 64 by 141 feet, and with a wing 30 by 70 feet, was under way. The wing was especially arranged for handling butter, ice cream, and market milk. The building was to be thoroughly modern in every respect, and would have a refrigerating plant in the basement to provide cold storage facilities. Plans have been made for an agricultural engineering building as a part of the agricultural group. In New Jersey a commodious agricultural building was occupied about the middle of the year. This was located at the farm and accommodated the principal departments of the college, the experiment station, and the extension department.

The new soils building at the Cornell College of Agriculture was completed at a cost of

\$100,000. The new building was named Caldwell Hall, in honor of the late Dr. G. C. Caldwell, professor of agricultural chemistry in the institution for many years. A new animal husbandry building at the same institution, with a stock judging pavilion, 80 by 160 feet, was also occupied. The North Dakota Agricultural College completed a new fireproof dairy building; and a new horticultural and forestry building was dedicated at Ohio State University early in the year. The latter building is a two-story and basement fireproof structure, 60 by 250 feet, similar in general appearance to the main agricultural building.

The 1915 Congress passed an act setting aside four sections of land near Fairbanks in the Tanana Valley, Alaska, as a site for a territorial agricultural college and school of mines. A portion of this tract was occupied by one of the Federal experiment stations. No funds had yet been provided or plans made for the establishment of such an institution.

Arrangements were completed between Ohio State University and eight other colleges of the State for the five-year combination of arts and agriculture courses. Under this plan the first three years could be spent at a liberal arts college and the last two at the State University, the B.S. degree being conferred by the former institution at the end of four years, and the B.S. in Agriculture by the university at the end of the fifth year.

The preparation of men for various grades of agricultural teaching, for agricultural extension work, and for agricultural investigation in the experiment stations were subjects which received special attention at the annual convention of the Association of American Agricultural Colleges and Experiment Stations in 1915. The convention was held in August, at Berkeley, Cal. In the discussion of the training of agricultural teachers, it was shown that the efforts of the agricultural colleges were inadequate to the needs. In rural school teaching, the opening up of an avenue for the teachers outside the school room in conducting community work had been a great incentive to men to enter the field. For promoting advanced study by station men, a co-operative arrangement was entered into by several institutions for an exchange of station men, under which time and opportunity were afforded for study in special lines. The committee on agricultural instruction of the above Association dealt with college courses for the preparation of extension workers. The committee recommended that a considerable number of agricultural colleges should offer undergraduate courses for the purpose, and that a few should also make special provision for graduate instruction.

GRADUATE SCHOOL OF AGRICULTURE. The seventh session of the Graduate School of Agriculture was to be held in July, 1916, at the Massachusetts Agricultural College, under the auspices of the Association of American Agricultural Colleges and Experiment Stations. The school was to continue four weeks, and include courses of instruction under three general heads: (1) Factors of growth of plants and animals, (2) agricultural economics and rural sociology, and (3) fundamental problems of intensive agriculture. The Association recommended that college and station employees should be encouraged to attend the school and that no time should be deducted on account of such absence.

SECONDARY SCHOOLS. The movement for the introduction of agriculture into the curricula of public and private high schools continued as in preceding years. In 1915 there were 1677 such schools reporting agricultural courses, an increase of 263; the number of pupils in such courses was 34,367, or an increase of 4552 over the preceding year. An interesting experiment in secondary agricultural education was being tried in Atlantic City, N. J. The county board of education was attempting to provide (1) a winter school for young men and young women engaged on farms during the summer, (2) supplementary help on the part of the teacher in home projects, (3) definite instruction for adults in short courses, and (4) assistance to county superintendents in the introduction of agriculture.

An act of the State Legislature in New York authorized the board of supervisors of any county outside of the city of New York to establish a farm school for the purpose of giving instruction in the trades and in industrial, agricultural, and home-making subjects. Each school will receive annually from the State \$1000, and an additional \$200 for each teacher employed.

The Southern Conference for Education and Industry, at a four-days' meeting at Chattanooga, Tenn., in April, gave much attention to the subject of agricultural education, especially in the schools, and the fitting of agricultural instruction into the courses.

EDUCATIONAL WORK OF THE DEPARTMENT OF AGRICULTURE. The Division of Agricultural Instruction in the Office of Experiment Stations, now the States Relations Service, continued to follow and study the progress of agricultural education throughout the world, and beginning with January, 1915, established an *Agricultural Education Monthly*, pertaining to methods of teaching agriculture in secondary schools, and furnishing references and suggestions upon timely topics suitable for subject matter. Attention was given, among other things, to organizing the published matter, especially that in the bulletins and reports of the Department of Agriculture and the agricultural experiment stations, as a basis for teaching courses in agriculture in the rural and high schools. Such material was assembled and published, to be used for subject matter in teaching, with suggestions for methods of instruction. Outlines also were prepared of courses in agriculture to meet the needs of the schools of particular States, and school lessons were prepared on such subjects as corn, cotton, tomatoes, poultry, etc.

CANADA. A college of agriculture was established in April, 1915, in connection with the University of Alberta. Only advanced work, preceded by a two-year course at one of the agricultural schools, was to be given at the college. The increased appropriation under the Agricultural Instruction Act of Canada enabled the government of Prince Edward Island to make progress in organizing a complete system of agricultural education, correlated with the general school system. In Saskatchewan an agricultural instruction committee was appointed to advise on all matters pertaining to the scope and character of agricultural education in the public, high, and normal schools. The Department of Education in the province was arranging for the appointment of agricultural instructors at each

of the normal schools. The Department of Education in British Columbia decided to include agriculture as an optional subject in the high schools. Extension courses in agriculture were to be opened for boys and girls who were not regular students in the high schools.

OTHER COUNTRIES. The Greek government established an agricultural school at Halmiyras. A national institute of agriculture and veterinary science at Bogota, Colombia, and an auxiliary school of agriculture and animal husbandry, to be located elsewhere, were authorized. A school of agriculture was started at Artemisa, Cuba, and similar schools were to be provided in different parts of the island. An agricultural school for boys was opened on a plantation near San José, Costa Rica. A school for farm mechanics was provided in Argentina, and in China a new school of forestry was established in the University of Nanking.

AGRICULTURAL EXPERIMENT STATIONS. Evidences of a sharper division between agricultural experimentation and various forms of agricultural extension teaching, and of a closer confinement of the stations to the acquiring of new information, were the most notable features of the year 1915. This had grown largely out of the organization of agricultural extension divisions in each of the States, under the Smith-Lever Act. These divisions were to take over the lines of work in the past conducted by the stations to considerable extent, in the instruction of the farmer through lectures, correspondence, answering inquiries, local demonstrations, etc. The extension divisions were already relieving the station men of these demands upon their time and allowing them to concentrate more closely on experiments which would add new information or shed new light upon agricultural problems. This new service would in no way detract from the importance of the experiment stations or the need of their continued activity, but on the contrary would make them the more necessary to continued advancement, and would make their work more effective in bringing about improved methods and practice.

There was also a general movement to place the inspection work more largely under other agencies. This work had grown steadily in variety and extent, and in many instances the control or inspection provided by State laws had been placed with the experiment station because in many instances it was the only institution competent to perform such service and because it enjoyed the public confidence. There was a marked tendency to regard the stations as research institutions, and to relieve them from other duties and responsibilities in order that they might confine themselves quite definitely to experiments and investigations. The staffs of the stations likewise were differentiated to an increasing extent from the teaching force of the agricultural college and the staffs of the extension departments. This was a recognition, not only of the desirability of freeing the station men from distractions, but also that the requirements for investigation were of a special nature and differed from those for other lines of activity. The publications of the experiment stations constituted a separate series from those of the extension departments, and the bulletins and reports were being restricted more closely to popular and technical accounts of the work conducted by the respective stations. There also

was a considerable segregation of the strictly technical accounts of the investigation from the more popular reports, in order that each kind of literature might better reach the class for which it was especially intended. At a considerable number of stations research bulletins were being issued which contained the technical reports of investigations and researches made at the stations, such matters as were of more general interest to the agricultural public being published in the regular bulletin series. Technical accounts of investigations were being published to an increasing degree in research bulletins, in the scientific journals of the country, and during the year, in the *Journal of Agricultural Research*, published by the U. S. Department of Agriculture in coöperation with the Association of American Agricultural Colleges and Experiment Stations.

The demand for local experiment stations was constantly increasing, partly as a result of the closer touch into which the extension work had brought the farmers with the experiment stations. Every session of Congress saw a large number of bills introduced to establish and maintain experiment stations for given localities or for particular branches of agriculture. Few such bills had passed, because it was felt advisable not to duplicate the agencies in the States, and where necessary to provide for local assistance or special branches of inquiry through coöperation of the Federal Department of Agriculture with the State stations. Many of the States had themselves provided branch stations, to be conducted under the supervision of the central State station. One of the largest of these was the station for the citrus industry in California, recently located at Riverside. A tract of 465 acres of land was purchased by the University of California, with funds provided by the State, at a cost of \$55,000, and construction of a laboratory building to cost \$100,000 was under way. A Graduate School of Tropical Agriculture was to be conducted in connection with the station. The director of the Citrus Station was Dr. H. J. Webber, former professor of plant breeding in Cornell University, and a corps of specialists had been brought together.

In Minnesota the Legislature quite materially increased the appropriations for the branch stations located at Crookston, Morris, Grand Rapids, Duluth, and Waseca, and for the fruit breeding farm at Zumbra. The State of Montana appropriated \$59,000 for the maintenance of its central experiment station, \$14,000 for the dry farming and other substations, and \$4000 for the grain laboratory. In Texas, the appropriations for the branch stations had grown rapidly. Six years ago the only appropriation made for the station work in the State was \$5000 for operating two substations. In 1915 the Legislature granted \$140,582 for the first year of the biennium and \$135,000 for the second, to cover the work at ten substations and provide one new station. A new branch station was established in Washington, in the "Big Bend country" along the Columbia River. The Ohio Station was authorized by the State to purchase lands suitable for the growth of forest trees, at not more than \$10 an acre, and to manage such lands as State forests. An appropriation of \$10,000 was made to begin this work. Other appropriations to the station, including the maintenance of several branch stations, amounted

to \$272,543. In Tennessee, a tract of 569 acres of land lying convenient to the university and station farm was acquired, largely to meet the needs of the station work, which included breeding experiments with live stock. The cost of the tract was about \$140,000, \$125,000 of which was raised by county bond issue and the balance by public-spirited citizens.

The New Jersey Station occupied a spacious new agricultural building adjacent to the farm and plats, at the close of 1914. In Massachusetts a new agricultural building was completed and dedicated as Stockbridge Hall, a part of which will be used by the experiment station. A special building for the work in genetics was provided at the Illinois Station, and elsewhere numerous additions were made to the physical equipment of the stations to meet the growing needs of their work.

An interesting side light, as showing the esteem in which station men are held in agricultural communities, was furnished by the election of Dr. James Withycombe, for many years director of the Oregon Experiment Station, as Governor of the State at the last election, by the heaviest majority ever accredited a gubernatorial candidate in the State.

President Wilson set aside from the public domain a tract of land of about 29,000 acres in Eastern Idaho, to be known as the United States Sheep Experiment Station. This was to be used by the Bureau of Animal Industry of the Department of Agriculture for its experiments in sheep breeding and management for the western ranges, which were to be conducted on a scale suitable for open range purposes.

The total revenues available to the experiment stations during the year, including those maintained by the Federal government in Alaska, Hawaii, Porto Rico, and Guam, amounted to \$5,164,687.96. Of this amount, \$1,426,167 was received from the United States under the Acts of 1887 and 1906, and \$2,574,605 from State appropriations, showing that the States considerably more than met the Federal government in direct appropriations for this purpose. In addition, the Office of Experiment Stations had an appropriation from the Federal government of \$461,260, including \$35,000 for the Alaska Stations, \$30,000 each for the stations in Hawaii and Porto Rico, and \$15,000 for Guam Station.

The value of additions to the equipment of the experiment stations for that year was estimated at \$1,012,370. The total force of the experiment stations numbered 1852 persons, engaged in administration and inquiry. About half of these were also members of the teaching staff of the colleges. During the year the stations published 1330 annual reports, bulletins, and circulars, aggregating 25,265 pages. These were distributed to regular mailing lists aggregating over one million names.

In the Dominion of Canada liberal appropriations for agricultural work continued. For the year 1915-16, \$785,000 was appropriated for the maintenance of experiment farms. Among other items are \$550,000 for the development of the live stock industry, \$150,000 for the development of the dairy industries and other agricultural products, \$140,000 to enforce the seed act, \$113,000 for the fruit branch, \$25,000 for the National Biological Laboratory, \$20,000 for entomology, and \$15,000 for publications.

In December, 1914, the Colombian minister of agriculture decreed the establishment of a national institute of agriculture at Bogota, with an experimental farm attached. An agricultural adviser to the Government of Colombia has been appointed. The Chinese government, in the spring of 1915, set aside more than \$100,000 for the purpose of starting experiment stations. They are grouped in four classes, devoted respectively to cotton, sugar, afforestation, and pasturage. There had already been established three cotton farms, one sugar plantation, two forestry tracts, and three pasturage farms. An American cotton growing expert was employed. There was also a model ranch at Chu Chow in North Anhui. A tract of 919 acres at Trinidad, Luzon, Philippine Islands, was reserved from the public domain for the use of the Board of Agriculture as an experiment station and stock farm. The French ministry of agriculture established a plant-disease branch during the year.

AGRICULTURAL EXTENSION WORK.

Great progress has been made during the year in the organization and development of the system of coöperative extension work in agriculture and home economics provided for in the Smith-Lever Act of May 8, 1914. All the States assented to the provisions of this Act. A single college in each State was designated as the beneficiary of this Act, thus providing for a unified administration within the State. In several States where the college designated was not co-educational a coöperative arrangement for the work in home economics was made with the State college for women. In a few States having separate land-grant colleges for negroes a similar arrangement was made for work among that race.

In all the States the colleges created extension divisions or services and brought under them all their extension work in agriculture and home economics, whether carried on with Smith-Lever or other funds. In some cases laws or administrative regulations adopted years ago continued a confusing union of the extension organization with that of the experiment station, which should be definitely set apart as the research division of the agricultural college. In 37 States a separate officer was in charge of the extension work, usually with the title of "director"; in 11 States this officer was also director of the experiment station or head of the college of agriculture.

All the colleges receiving the benefit of the Smith-Lever Act entered into definite coöperative relations with the United States Department of Agriculture and with two exceptions were conducting all extension work in agriculture and home economics under the terms of a general "Memorandum of Understanding" with the Department, which was used as the basis for a great variety of coöperative project agreements. The Department brought all its extension work under the general charge of the State Relations Service (see *United States Department of Agriculture*) and was carrying on its administrative and coöperative functions with reference to such work through that Service.

The general lines of this coöperative extension system for the country as a whole were well marked out and established. The main features were (1) the county agricultural agents, (2) the boys' and girls' clubs, (3) the movable schools, and (4) the supporting work of the college and Department specialists. The States accepted

with remarkable unanimity one of the fundamental features of this system developed by the Department. An experience of more than 12 years had fully demonstrated the value of the county agent as a means of bringing to people on their farms and in their homes the results of practical experience and scientific research and securing the actual application of these results. Under the new conditions created by the Smith-Lever Act it was highly important to establish in each county permanent headquarters, in charge of a competent agent, who should act as the joint representative of the local community, the State college, and the Department of Agriculture. In this way the needs of the community could best be determined and the help of the State and the nation could most speedily and effectively be brought to the rural people. About half of the extension funds from Federal, State, and local sources were being devoted to the maintenance and development of the county-agent system. Over 1000 counties already had men as agents, and in the 15 Southern States there were in addition over 350 women agents. On the whole, these agents were very successful in winning the support and confidence of the farming people, and the tangible results of their work were very encouraging.

Since the agent could not deal altogether with individual farmers he was active in organizing groups of farm people through whom he might work. There were two types of such organizations. County associations, often called farm bureaus, were being formed. These were expected to take the initiative in securing local financial support for the agent, to join in his selection and appointment, and to aid him in his work. Many of these organizations included business and professional men, as well as farmers. Another type was the small community club. Where a considerable number of these clubs existed in a county they had often been confederated to form a county organization. The exact relations of these organizations to the extension system, the breadth and variety of their functions for the advancement of agriculture, and their most effective organizations were largely undetermined and they were to be considered as in the experimental stage.

The work of the county agents covered a wide range of activities relating to agriculture and home life. In the 15 Southern States during the year ended June 30, 1915, direct demonstrations of good practices covering practically every phase of Southern agriculture were conducted on 105,000 farms, and approximately 500,000 visits to farmers were made.

Much work was done in the prevention of animal diseases, many creameries and cream routes were established and instruction given in the feeding of dairy cattle and the marketing of milk. About 500 communities were organized and engaged coöperatively in some special work such as breeding of live stock, purchasing and selling of seeds, crops, etc. The women agents visited about 50,000 farm homes and gave practical instruction regarding household conveniences, preparation of food, care of poultry, marketing of eggs, canning of vegetables, etc. In the Northern and Western States, where the work was comparatively new, the agents were instrumental in forming 875 local organizations. They conducted 35,000 demonstrations with crops and live stock. They visited 76,000 farms, addressed

meetings attended by 1,200,000 people, and assisted in developing agricultural instruction in 4600 schools. About 72,000 farmers and their families attended short courses or movable schools.

The boys' and girls' clubs, developed by the Department and the agricultural colleges prior to the passage of the Smith-Lever Act, were continued and the scope of their work enlarged. In the Southern States this work was organically connected with the county-agent system; in the other States it was organized separately. Through it the extension agencies were brought into close touch with the State and local school officers and teachers, who coöperate in the formation and management of the clubs. About 260,000 boys and girls were enrolled in these clubs during the year. Leading activities were the competitive growing of crops, raising of pigs and poultry, canning of vegetables and fruits, and making of home gardens. The prize winners, and others in many cases, attended short courses at the agricultural colleges, often with the aid of funds contributed in the local communities.

The force of extension specialists, with headquarters at the agricultural colleges, was greatly enlarged and covered many lines of agriculture and home economics. These officers supplemented the field work of the county agents, furnished them advice and assistance, gave short practical courses of instruction in the rural communities, conducted demonstrations along special lines, prepared publications, addressed meetings of farm men and women, and answered inquiries. Specialists were also sent out by the Department of Agriculture to work with the extension agents. Among these, for example, were specialists in dairying, animal husbandry, use of hog-cholera serum, tick eradication, marketing of agricultural products, farm management, and the home canning of vegetables and fruits.

For the fiscal year beginning July 1, 1915, the total funds available for extension work from Federal, State, and local sources was nearly \$5,000,000. Of this, \$1,200,000 was derived from direct appropriations of the Department of Agriculture, and \$1,080,000 from the Smith-Lever Act, making the total Federal contribution \$2,280,000. This was met by approximately \$2,653,000 from sources within the States, including \$600,000 to offset the equivalent allotment of Federal Smith-Lever funds, \$499,000 from additional State appropriations, \$333,000 from college funds, \$944,000 from counties, and \$277,000 from local organizations and miscellaneous agencies. About \$2,500,000 was to be used for the demonstrations and other activities of the county agents. Much of their work bore directly on farm-home problems, but \$550,000 was allotted to distinctive work in home economics. More than \$300,000 was to be used for work among boys and girls. Nearly \$1,000,000 was to be devoted to the tasks of the specialists.

Farmers' Institutes covering from one to three days had long been important agencies for the dissemination of agricultural information in the United States. In 1914 the number of such institutes was 7740, with a total attendance of about 3,000,000. In about half the States these institutes were managed by the agricultural colleges. Since the passage of the Smith-Lever Extension Act the institutes connected with the colleges underwent considerable reorganization and in increasing measure were replaced by other

forms of extension work. In the 23 States in which the institutes were conducted by the State departments of agriculture the number of institutes held in 1915 was about 4000, with an attendance of 1,750,000, at a cost of about \$210,000. In Ohio and South Dakota the control of the institutes was transferred to the agricultural college.

In Russia the Agricultural Museum at Petrograd was conducting courses in agriculture for wounded soldiers in 83 hospitals near the city. The lessons were illustrated by lantern slides, charts, etc., and were followed by the distribution of pamphlets and other printed matter.

In Spain there was considerable activity in the promotion of excursions to special agricultural regions which were utilized for demonstrations, and also in the holding of "agricultural week" meetings.

In Germany the great women's unions of Saxony with the assistance of the minister of agriculture held in Berlin a course of instruction in agriculture and housekeeping with the object of teaching strict economy in the use of food and the prevention of waste made necessary by war conditions. The course was attended by about 200 teachers and presidents of women's societies. These were then sent to the rural districts throughout the province to organize classes of farm women and to instruct each from six to eight days regarding the best ways to economize in cooking, the feeding of live stock, and managing the entire farm in the absence of the husbands.

In Manitoba, Canada, "auto lecture tours" were organized. Each automobile carried five speakers, three on agricultural subjects, and two on home economics, together with charts and lantern slides. By this method the remote rural districts were reached. The meetings, held in rural school houses and churches, were attended by from 40 to 400 farmers. The Ontario women's institutes continued to increase in importance during the past summer. Meetings were held at 808 points, with an attendance of 202,504.

A system of extension teaching for farmers was undertaken by the Chinese Minister of Agriculture and Commerce, beginning with the establishment of an extension school for the training of lecturers and demonstrators, who were to travel throughout the country introducing improved methods of farming. This work was to be done in cooperation with the experiment stations recently provided.

AGRICULTURAL LEGISLATION. LEGISLATION IN THE UNITED STATES. Unusual interest was manifested in providing better rural credit facilities. A joint congressional committee was appointed in March to report by Jan. 1, 1916, a bill or bills for a system of rural credits. President Wilson in his message at the reassembling of Congress in December, 1915, also drew attention to the need for some provision for "adequate instrumentalities by which long credits may be obtained on land mortgages." Many bills aiming to accomplish this purpose were pending at the close of the year. Ohio appointed a committee to study rural credits, as well as cooperation, and California a commission on rural credits and land colonization. In Massachusetts, a farm-land bank was incorporated under a new law which permits long-time loans with farm mortgages as security and also the sale of bonds secured by these loans.

Missouri voters were to decide in November, 1916, as to the establishment of a State bank with similar powers. Minnesota and North Dakota were also to vote as to the use of State funds for farm loans. In Kansas, building and loan associations were authorized to issue rural credit shares, investing the proceeds in farm mortgages. Oregon authorized the formation of rural credit unions and cooperative State banks, and Massachusetts amended its credit union law, under which farm loans may be made. In South Carolina, the Commissioner of Agriculture was authorized to assist in placing loans on stored cotton, charging a commission for this service, and Texas required notes secured by cotton and grain in bonded warehouses to be accepted as negotiable property. Efforts to obtain Federal legislation, however, for increasing the value of warehouse receipts as security for loans by providing for the Federal licensing of warehouses for storing agricultural staples were unsuccessful. A State superintendent was appointed in North Carolina to organize and supervise credit unions, land and loan associations, and cooperative organizations. Colorado, Massachusetts, and South Carolina revised their laws pertaining to cooperative associations, and New Mexico authorized their establishment under prescribed regulations. In Oregon, farmers' associations were given the right to quarry lime.

The Federal appropriation for the study of marketing problems was increased to \$238,000. In California, a State commission market system was provided for handling agricultural, dairy, and fishery products. Idaho appointed a director of farm markets to cooperate with producers and consumers, as well as to investigate alleged frauds in the sale of real estate to home seekers, regulate advertising pertaining to colonization, maintain a farm labor employment bureau, list farm property for sale for the use of prospective buyers, and otherwise improve farm life conditions. Colorado and Maine provided for studies of marketing farm produce, and the latter also of the purchasing of farm supplies. In Colorado, Florida, and Kansas, commission merchants were required to obtain licenses, while in Michigan the law was amended. Public markets were authorized in Massachusetts communities of over 10,000, and their establishment or the designation of public market spaces was required. Farm and grove products sold by growers were exempted in Florida from license fees. Unfair discrimination by buyers against producers of farm products was specifically prohibited in Oregon and Wyoming.

A standard barrel was prescribed by Congress for fruits, vegetables, and other dry commodities handled in interstate commerce after July 1, 1916. This barrel contains 7056 cubic inches, except that for cranberries a smaller size is provided. California prescribed standard crates for apples, certified seed potatoes, and dairy products, with a system of State inspection as well as standard packages for most fruits and vegetables. Connecticut, Massachusetts, and Vermont established standard crates and packages for apples, and Colorado for small fruits and berries. Delaware enacted an apple grading and marking law. Montana amended its apple box law and New York and Washington their apple branding laws, the former by permitting increased variations from the standard. North Carolina and Tennessee required the marking of

fruits and vegetables to show the grower or packer, and Wisconsin the marking of all containers for farm produce to show the nature of the contents. Florida established a standard field box for citrus fruits. North Carolina promulgated standard grades for cotton and authorized a system of official graders. Michigan authorized the use of a State brand for high-grade butter, and Oregon and Washington further safeguarded the use of brands. Illinois, North Carolina, and Wisconsin provided for the registration of farm names.

The Federal Plant Quarantine Act was amended as regards interstate shipments by mail into States maintaining a system of terminal inspection of plant products by requiring, under certain conditions, the labeling of packages of plants and plant products, and their transmission to central points for inspection. Many of the States also adopted more stringent laws against the introduction and spread of both plant and animal pests. Florida passed a comprehensive plant quarantine act, and Nevada formulated extensive quarantine regulations for agricultural and horticultural plants, domestic animals, and bees. Colorado, Oregon, and Washington amended their laws as to county inspection. Kansas required the disinfection of grain sacks, and Minnesota of stock cars. Arkansas, Connecticut, North Carolina, and Oregon further restricted the running at large of farm stock.

New Hampshire provided for the inspection of insecticides and fungicides, Delaware of seeds, Idaho of Babcock apparatus, Michigan of galvanized wire fencing, New Jersey of bees and pasteurized milk and cream, Pennsylvania of lime, and Missouri and Montana of grain and its grading in elevators, warehouses, etc. New Mexico adopted a new stallion registration law. Amendments were adopted in Minnesota, New Hampshire, New York, and South Carolina as to fertilizer laws; in Connecticut, Illinois, Kansas, Michigan, Nevada, New Hampshire, and South Carolina as to feeding stuffs; in Indiana, Massachusetts, and Montana as to nursery inspection; in Nebraska, New Hampshire, Tennessee, Washington, and Wisconsin as to seed inspection; in Nebraska as to weed control; and in California, Michigan, Montana, Nebraska, Ohio (repeal), and Wisconsin as to stallion registration. Maine provided for the inspection of milk and dairy products, and Massachusetts prohibited dairy inspectors from charging fees for their work. Connecticut and Florida regulated the operation of live stock insurance companies, and New York amended its laws as to nursery stock sales.

Certain public lands in Alaska were set aside by Congress for the eventual support of a Territorial agricultural college and school of mines. The Federal Smith-Lever Act of 1914 was formally accepted by the several States, and supplementary legislation enacted in many of them to facilitate the development of extension work. New York and North Dakota authorized counties to establish agricultural and training schools, the former also granting State aid. Florida and Kansas permitted boards of education to purchase land for teaching agriculture, and the former State required teachers to have special training in the subject. Nebraska, Ohio, and Texas also amended their laws as to agricultural education.

A State department of agriculture was estab-

lished in Wisconsin, centralizing much of the demonstration and inspection work. Missouri reorganized its board, and Ohio abolished its agricultural commission and reestablished its board of agriculture. Pennsylvania established a State commission of agriculture and Delaware a commission on milk supply. Florida established Farmers' Day as a legal holiday, California a bird and arbor day, and North Carolina an arbor day. In South Carolina, the Commissioner of Agriculture was empowered to distribute inoculating material for leguminous crops. Montana counties were authorized to sell seed grain to needy farmers, taking a lien on their property to secure payment. North Carolina authorized the sale of lime to farmers at cost, as well as the use of convict labor in lime-crushing plants and on county demonstration farms. Porto Rico provided for the sale of small holdings to laborers.

FOREIGN LEGISLATION. An agricultural economic commission was appointed in Canada to study questions related to the production, marketing, and distribution of farm products, including the encouragement of education, coöperation, transportation, and storage of products, colonization, and the securing of capital. In British Columbia, an agricultural credit commission was established to lend money to individuals or associations for developing agricultural holdings. Alberta levied a special tax on uncultivated lands suitable for agriculture with a view to hastening their development. In Manitoba, municipalities were authorized to borrow money for loans to farmers for the purchase of seed grain. Saskatchewan required the fulfillment of contracts as to warranties and the maintenance of uniform prices for farm implements and repairs. A stock inspection act was passed in Alberta and apiary inspection provided in New Brunswick. Saskatchewan amended its laws as to coöperation and the granting of hail insurance.

The export of all kinds of feeding stuffs, fertilizers, agricultural seeds, farm implements, and most food materials was prohibited in Great Britain, and a similar embargo as to food products was issued in France. Great Britain also passed a live stock act to remain in force for one year after the close of the war, under which the Board of Agriculture and Fisheries may prohibit or restrict the slaughter of all animals, except male lambs, or the sale of meat from immature animals. France established a commission on farm labor, and reorganized its phytopathological service, coördinating the work of existing services and institutions. A board of agriculture was established in New Zealand and a reorganization of agricultural activities effected in Portuguese East Africa.

AGRICULTURE. In spite of the greatly disturbed condition of the world during the year, the 1915 world's wheat crop largely exceeded that of any previous year and surpassed that of 1914 by several hundred million bushels. The yields in every important country except France and Austria exceeded those of the previous year. More than half of the increased production was ascribed to an expansion of wheat growing in non-European nations. The acreage sown to wheat on the Continent of Europe was reported to have fallen short of that of 1914 by from two to three million acres.

"WORLD" CROPS OF WHEAT, RYE, OATS, BARLEY, AND MAIZE, 1914 AND 1915. (IN BUSHELS)

	Wheat			Rye			Oats			Barley			Maize		
	1915	1914	1915	1915	1914	1915	1915	1914	1915	1915	1914	1915	1915	1914	1915
United States	1,011,595,000	891,017,000	49,190,000	42,779,000	1,540,892,000	1,141,080,000	287,009,000	194,958,000	8,054,585,000	2,672,804,000					
Canada	886,258,000	161,280,000	2,478,000	2,017,000	481,035,000	313,078,000	50,868,000	36,201,000	14,594,000	13,924,000					
Argentina	193,400,000	118,904,000	1,852,000	8,346,000	88,790,000	50,981,000		8,087,000	388,510,000	204,562,000					
Chile	22,765,000	11,986,000		140,000		4,000,000		5,741,000							
Uruguay		5,887,000		1,000		1,850,000		165,000							
Austria	57,500,000	57,500,000	109,250,000	95,000,000	162,500,000	150,000,000	75,000,000	75,000,000	14,500,000						
Hungary, Croatia, Slavonia.	160,000,000	133,155,000	47,510,000	49,708,000	80,125,000	97,568,000	65,475,000	72,086,000	180,700,000						
Belgium	14,750,000	18,973,000		21,000,000	43,960,000	49,742,000	4,270,000	4,232,000							
Bulgaria	46,160,000	36,000,000	7,628,000	9,842,000	7,445,000	8,000,000	17,658,000	10,000,000							
Denmark	7,940,000	4,700,000	13,353,000	17,000,000	52,020,000	48,000,000	28,046,000	20,000,000							
France	256,354,000	319,667,000	40,555,000	50,000,000	284,550,000	325,000,000	37,360,000	47,000,000	21,147,000	22,000,000					
Germany	155,000,000	160,000,000	438,300,000	440,000,000	591,000,000	620,000,000	150,000,000	140,000,000							
Greece		7,000,000													
Italy	170,340,000	169,442,000	4,365,000	5,260,000	31,445,000	26,827,000	11,043,000	6,917,000	118,200,000	105,006,000					
Netherlands	5,673,000	5,380,000	13,739,000	14,695,000	19,765,000	19,958,000	8,230,000	8,210,000							
Norway	268,600	269,000	1,045,000	1,046,000	9,325,000	9,325,000	2,590,000	2,591,000							
Portugal		10,000,000													
Rumania	108,632,000	49,270,000	8,152,000	1,959,000	26,180,000	25,015,000	23,685,000	25,505,000	110,320,000	110,280,000					
Russia, Europe	764,058,000	597,000,000	949,750,000	870,000,000	959,100,000	800,000,000	491,600,000	400,000,000	75,000,000	80,608,000					
Russia, Asia	143,680,000	180,000,000	28,396,000	39,992,000	138,800,000	162,906,000	18,045,000	19,561,000	313,000						
Serbia		9,000,000		1,000,000		5,000,000		3,000,000							
Spain	144,000,000	116,089,000	28,690,000	23,950,000	36,350,000	31,237,000	84,417,000	72,272,000	27,350,000	20,000,000					
Sweden		8,472,000	23,853,000	27,599,000		52,557,000	14,120,000	12,195,000		30,825,000					
Switzerland		3,480,000	2,116,000	1,741,000	5,545,000	4,757,000	601,300	534,000							
Turkey, Europe		18,000,000													
Turkey, Asia		85,000,000													
United Kingdom	74,010,000	64,446,000	1,288,000	1,800,000	214,325,000	180,500,000	49,630,000	66,642,000							
British India	383,000,000	314,608,000						2,000,000							
Japan	21,802,000				5,100,000			102,817,000	3,750,000	3,753,000					
Algeria	34,615,000	30,000,000			15,095,000	10,000,000	89,840,000	30,000,000	457,000						
Egypt	39,100,000	33,088,000					13,787,000		70,980,000	66,744,000					
Tunis	11,010,000	2,205,000			3,445,000	689,000	11,475,000	9,000,000	221,000						
Australia	30,000,000	106,600,000		100,000		15,712,000		4,043,000							
New Zealand	5,000,000	5,559,000		90,000	12,190,000	15,206,000	580,000	1,284,000							

This reduction was confined mainly to Russia, France, and Rumania. The wheat production of France, the second important wheat producer in Europe, was estimated to represent a shortage of approximately 60 million bushels, which would necessitate importing about a million bushels.

In the United States the wheat crop was the largest ever grown, passing the billion bushel mark for the first time. No country had ever equaled it, and it represented about one-fourth of the entire world's production in 1915. The total acreage of 60 million acres in wheat was equivalent to the combined total area of the six New England States plus New York and Pennsylvania. In Canada, British India, and several other important wheat producing countries there were either record or near record crops.

The rye, barley, and corn crops of the northern hemisphere each represented a considerable increase over 1914. The estimate of the International Institute of Agriculture for all cereal crops in the northern hemisphere was 108 per cent of normal, or more than enough to meet the needs.

In the United States the corn crop was the second largest ever raised, being 16 per cent higher than in 1914 and 14 per cent above the average for the five preceding years. The quality, however, was low. There were record crops of oats, rye, barley, rice, and hay, in addition to the wheat crop already mentioned. The potato crop declined as the season advanced, on account of blight and rot, but was up to the five-year average. Tobacco production was slightly larger than in 1914 and about 4 per cent above the five-year average. The cotton crop was a short one, estimated at a little over 11 million bales, owing to a 15 per cent reduction in areas and a 20 per cent poorer yield. The quantity of cotton carried over from the 1914 crop was considerably larger than usual. The high farm prices of products gave the principal farm crops an aggregate value of \$5,568,733,000, the highest ever attained by American agriculture. It was estimated that the value of minor crops and animal products would bring the total up to 10 billion dollars.

The total agricultural exports of the United States in the fiscal year ended June 30, 1915, practically the first year of the war, were \$1,470,000,000, representing an increase of \$356,000,000, or 32 per cent over those of the preceding year, and of \$433,000,000 or nearly 42 per cent over the average of the five years, 1910-14. As compared with the preceding year, exports of horses and mules increased from 4 to 77 million dollars, meat and dairy products from 146 to 220 million, wheat and flour from 142 to 428 million, corn and corn meal from 7 to 39 million, oats from 1 to 57 million, and barley from 4 to 18 million dollars; while cotton decreased from 610 to 376 million, and tobacco from 54 to 44 million dollars. These products comprised nearly nine-tenths of the total agricultural exports.

An interesting statement by the Department of Agriculture, showing the extent to which the principal farm crops of the world were transported from the countries of their origin to other countries, based on the estimated value per year, was as follows: Cotton, \$1,127,000,000; wheat and flour, \$744,000,000; raw wool,

\$480,000,000; hides and skins, \$392,000,000; coffee, \$386,000,000; sugar, \$382,000,000; rice, \$278,000,000; barley and malt, \$220,000,000; corn and meal, \$210,000,000; unmanufactured tobacco, \$192,000,000; butter, \$173,000,000; tea, \$143,000,000; rye and flour, \$125,000,000; and oats, \$102,000,000.

SPECIAL CROPS AND INDUSTRIES. The Manila hemp (abaca fibre) crop of the Philippine Islands was estimated at 1,030,000 bales or about 40,000 bales more than in 1914. The prevailing prices were lower than usual on account of the war, and as a result it was expected that the crop would net some \$2,000,000 less than it ordinarily would. The final official forecast for the 1915 jute crop of India placed the area under cultivation at 2,377,316 acres and an estimated upturn of 7,428,733 bales of 400 pounds each. This represented a decrease of nearly 30 per cent in the area as compared with 1914, which was the second largest, and a production of about 2½ million bales less than the previous crop. Soy bean culture was extending in the United States, especially in the Southern States, where the cotton mills furnished a market for the beans, which are crushed for oil. The cake left from the expression of the oil is a highly nitrogenous stock feed. The beans are also ground and fed to live stock, and the vines are utilized.

Kaoliang, a Russian early grain sorghum introduced by the United States Department of Agriculture, was tested as a dry-land crop and gave promising results, notably in South Dakota. It is drought resistant, with a comparatively low moisture requirement, and had produced satisfactory yields in the driest seasons. Both seed and stalks were utilized for feed.

The special campaign inaugurated in 1914 by the Philippine Bureau of Agriculture for the greater growing of food crops was productive of good results in many sections of the islands. Secondary crops, including corn, camotes, gabi, mongo beans, cowpeas, and the like, were grown on quite a large scale. In some sections, it was reported, practically the entire population had been placed beyond dependence upon the importation of foodstuffs.

Coffee imported into the United States in the calendar year 1914 exceeded one billion pounds, a record only made twice before. The value of the import was \$150,000,000, or \$25,000,000 less than in 1912 when an unusually high price prevailed. Brazil was the chief source of supply, over three-fourths of the total amount coming from that country. The total coffee export from Brazil in the fiscal year ending July 31, 1915, was 13,401,515 bags, as compared with 14,533,581 in the previous year. The United States continued the chief purchaser, taking 5,880,619 bags, France being a second with 1,808,815 bags. No shipments were made to Germany, Austria, or Belgium, which in the preceding year took an aggregate of 3,431,506 bags. An increasing share of the coffee consumed in continental United States was produced in Porto Rico and Hawaii. In 1914, 2,793,052 pounds were brought in from Porto Rico, as compared with 372,427 pounds in 1894. Hawaii furnished about 3½ million pounds. The Porto Rican and Hawaiian coffees brought higher prices than the South American. The United States is the world's largest consumer of

coffee. The consumption is now reported at 10 pounds per capita, having nearly trebled in the past 50 years.

The production of fired tea in Japan in 1914 amounted to 71,345,944 pounds, valued at \$7,-373,320.

Provisional estimates for the world's production of raw silk during 1914 were 48,215,000 pounds, as compared with the revised statistics of 60,230,282 pounds in 1913 and 59,447,641 pounds in 1912. The apparent falling off in 1914 was not thought to represent a diminished production, but to be due to the war having almost completely suppressed arrivals of raw silk in France from Turkestan, Persia, and the extreme Orient, from which the supply was largely derived. More raw silk was brought into the United States in 1914 than in any previous year. Japan supplied a large and increasing proportion of the raw silk consumed by American factories. Ten years ago she supplied more than half and in 1914 nearly three-fourths of the total used.

Ostrich farming in South Africa was reduced to a very low ebb as a result of the remarkable decline in the feather industry. Birds were reported early in the year to be dying by thousands for lack of food and attention. The market for feathers improved somewhat during the year, but under the changed conditions a greater amount of the land is being put under cultivation. In times of prosperity that country exported about \$25,000,000 worth of feathers. A similar fate has overtaken the industry in the United States.

THE WAR AND AGRICULTURE. The war in Europe had a far reaching effect upon agriculture and agricultural labor, and the prime importance of producing and maintaining adequate food supplies made farming the object of unusual public attention. In Great Britain the government took unusual measures to foster agriculture and to prevent the depletion of live stock and breeding animals. At the outbreak of the war an agricultural consultative committee was appointed in England as a permanent committee, to which the Board of Agriculture looks for advice in relation to many agricultural subjects. In June the president of the Board of Agriculture also appointed a departmental committee to consider and report what steps should be taken to maintain and if possible increase the production of food in England and Wales, on the assumption that the war might be prolonged beyond the harvest of 1916. The committee made an interim report in July, restricted to wheat growing, in which it proposed a government guaranty of 45 shillings a quarter on wheat (approximately \$1.35 a bushel) for four years, commencing after the harvest of 1916. The government, however, decided not to establish such a guaranty. Similar committees were appointed in Scotland and Ireland. Another departmental committee dealt with the question of fertilizer supplies, studying the means of maintaining adequate supplies for the use of farmers in the United Kingdom. A system of district and county war agricultural committees was provided in England as a means of maintaining a closer contact with the farmers and aiding them in all possible ways.

The English government made forceful appeals to the farmers to increase the size of their crops to the utmost, to maintain their flocks

and herds in spite of the labor and feed situation, and to do their best to keep up the supply of food "as a special war service" to their country. It was suggested that they plow up the poorest of the permanent pastures, shorten the period of grass and clover in rotations, improve the remaining grass land so that it would carry more stock, cultivate cash crops and other home grown feeds, and reduce the acreage of bare fallow wherever possible. Circulars were issued by the Board of Agriculture warning them to store their crops with the greatest care, to save all material which could be used as fodder, and to waste nothing. Month by month the publications of the Board contained notes on the relative value of feeding stuffs in proportion to their cost, to aid in economical selection; and unusual importance was attached to the use of tested seed to insure larger crop returns, and to the control of insects and plant diseases. Attention was turned to utilizing the large areas of land not ordinarily employed for agriculture, and a canvass showed the very considerable extent to which golf links were being used for grazing sheep, cattle, and horses, and in some cases for making hay.

In the one item of hay, the requirements of the army amounted to approximately one-fourth of the entire annual production. The War Office required farmers to make returns as to the stocks of hay in the country, urged them to offer their supply freely, and gave notice that where it was unreasonably withheld the powers of requisitioning hay would be employed.

To meet the requirements of British soldiers in hospitals at home and in France, a supply of 300,000 eggs a week had been needed. This was maintained by a National Egg Collection for the Wounded, with branches throughout the country, which made urgent appeals for assistance from time to time, in view of the difficulty experienced in securing the necessary supply.

The shortage of labor, the increased cost of feeding stuffs, and the high prices of all classes of live stock necessitated special measures to conserve the supply of meat and dairy animals. The British government passed a law prohibiting the slaughter of calves or immature stock, or animals in calf or in pig. To encourage the breeding of horses orders were given by the War Office to avoid as far as possible the purchase of mares and on no account to purchase by impressment any mares to be used the coming season for breeding. The War Office also arranged for the return to England of mares no longer suitable for army use but which were of good type for breeding purposes.

The address of the president of the Agricultural Section of the British Association, at the annual meeting in September, dealt with the subject of "Farming and Food Supplies in Time of War," showing the share contributed by British agriculture to the national food supply, and the extent to which it has assisted in making good the lack of supplies cut off by the war. There was an increase over the normal production during the first year of the war. Very few agricultural shows were held in any part of Great Britain.

On the Continent the effects of the war were even more pronounced. Women cultivated the fields and harvested the crops to an unusually large extent, and every precaution was taken to avoid waste of food and fodder and to utilize

new sources. In France measures to maintain the live stock were adopted, similar to those in Great Britain. These prohibited the requisition of cows in calf or giving milk, or brood mares in foal or with foal, male breeding stock which had won prizes or belonged to livestock improvement associations, registered stock or its offspring, heifers, and work oxen. In some countries the governments were empowered to take over the supplies of wheat and flour, and late in the year the Canadian government commandeered 16,000,000 bushels of wheat for the British government. These measures were taken, not only to insure sufficient and regular supplies, but to prevent speculation and control prices. In Australia the government assumed control of the frozen meat export, in the interest of Great Britain. In Germany, transactions in these food commodities were forbidden early in the year.

Such measures were not confined to the warring nations. The Government of Portugal took over the entire wheat crop and authorized the import of nearly 7½ million bushels of wheat through its War Office, in order to regulate the supply and price of bread. To stimulate production in that country a large number of prizes were offered for the best wheat crops on 5 and 20 hectare areas.

Methods were devised in Germany to produce feed from straw, peat, and various other coarse materials through the action of fungi. Many substitutes for oats were being experimented with, besides the sugar feed containing 10 to 20 per cent of cut straw. The use of dried beets had become extensive in Germany. Dried chicory roots, called "chicory crumbs," were found to be an excellent substitute for oats.

France was taking up the matter of remunerating the farmers for war losses. A law passed at the close of 1914 established the right to compensation for material loss caused by war, and in February, 1915, valuation commissions were organized. Special rules were formulated in regard to damage to farms. These applied to agricultural machinery and equipment, cattle, agricultural products and standing crops, vineyards, hop yards, orchards, gardens, nurseries, drains and canals, the restoration of fields, and permanent depreciation of the soil through covering it with infertile layers. Special rules also were laid down in regard to damage to forests.

AGRICULTURAL LABOR. Reference has been made to the natural effect of the war on agricultural labor. In England about 15½ per cent of the farm laborers had joined the forces by the beginning of 1915. The shortage was keenly felt, and wages increased. The government exempted from enlistment farm laborers of various kinds, teamsters, shepherds, engine drivers, and operators of farm machinery, old age pensioners were permitted to labor, and special leave was granted postmen to work in the harvest. The army council announced that a limited number of soldiers accustomed to team work would be furloughed to assist in the fall plowing and other work. Partially disabled soldiers were placed on farms as they became fit, and the utilization of Belgian refugees was taken up. Strong appeals were made to women to offer themselves for light farm work as "a national war service." Thousands of women were reported to have responded, many of whom

were already in training. The more extended use of labor-saving implements and machinery was advocated, and to enable their purchase attention was turned to the formation of coöperative farm implement societies, on the plan of those in Ireland. Local demonstrations of such machinery were held.

On the Continent prisoners of war were used quite extensively in farming. In Germany large numbers were employed with satisfactory results. In France they were assigned for the purpose in gangs of 20, the farmers to feed and lodge them and pay them 40 centimes per man per day. That country also arranged to turn over to the Department of Agriculture 20,000 navy conscripts to be distributed where labor was most needed.

The farm labor problem in Canada was a vital one, according to the Commission of Conservation. The supply was insufficient and much of it had not had sufficient training to do farm work economically. The unequal distribution of work through the year also prevented the economical use of labor, as did also the employment of inadequate machinery and implements on the farm.

The United States Department of Labor undertook to assist farmers in securing laborers and especially harvest hands. The coöperation of the Post Office Department and the Department of Agriculture was had in the enterprise. Approximately 50,000 men were directed to employment through this means, and the farmers were enabled to gather their wheat harvest in due season.

GERMAN BOARD OF AGRICULTURAL ADVISERS. Mention has been made of the temporary agricultural committees appointed as an outgrowth of the war situation. In this connection it may be noted that Germany had a permanent Board of Agricultural Advisers, dating back to 1872, which was in position to render the government assistance in time of peace or war. This board, known as the *Landwirtschaftsrat*, is a semi-official body, having the general object of improving the agricultural conditions of the Empire by suggesting needed measures or legislation. It is composed of representatives from the various German states and colonies, in proportion to their number of votes in the federal council (*Bundesrat*). Meetings are held at the call of the president of the board, as necessity requires. Its work during the war was reported to have been of the utmost importance in conserving the national food supply, and in advising legislation and other measures for promoting crop production.

AGRICULTURAL MACHINERY. In spite of the increased interest in agricultural machinery in Europe to meet the shortage of labor, the difficulties of import have limited the increase in its use. In Russia this difficulty led to movements to establish local factories for its manufacture. The exports of American agricultural implements during the fiscal year 1915 totaled approximately \$10,000,000 as against \$40,600,000 in the high record year of 1913 and a yearly average of \$29,000,000 for the decade ended 1915. The loss of trade fell most heavily upon sales to Europe, but there were also decreases in shipments to Argentina, Canada, and various countries of Africa. The European war was doubtless the dominant factor in this falling off. Thus the export of implements to

European Russia, usually the greatest foreign market, practically ceased, as did also those to Germany, while huge losses occurred in sales to France and other European countries.

A comparison of the entries of farm machinery at the first show of the Royal Agricultural Society of England in 1839 with those at the show in 1915 gives an idea of the tremendous development in this line. At the first show 75 years previously, only 16 mechanical appliances were shown, consisting of a grubber, a mold-board plow, two subsoilers, two cultivators, a swing plow, one horse hoe, one chain harrow, etc. They were typical of the best and most advanced farm machinery of that period. The exhibits of farm machinery in 1915 numbered 4230, and in addition 19 new implements entered for silver medals. These exhibits included planters, seeders, reapers, binders, and other harvesting machinery, motor plows, traction engines, etc., besides the simpler forms of implements.

Activity was reported in China in the invention of various agricultural implements and machines for saving labor. In the United States and Canada attention has been attracted to electricity as a source of power for operating labor-saving machinery, and especially threshing outfits. With electrical energy at five cents per kilowatt-hour, the operating expense was estimated at considerably less than that with a steam engine. A trial in Ontario showed a saving of nearly 40 per cent as compared with steam, basing electrical energy on the above figures.

BINDER TWINE. Early in the spring the supply of binder twine in the United States became threatened through the closing of the port of Progreso, Yucatan, by the Mexican authorities. The supply of twine for the United States and Canada is made in the former country, requiring about 200,000 tons of sisal hemp a year, derived in large part from Yucatan. This supply is not accumulated at the factories but is brought in regularly through the year. Grain is harvested so largely by means of the binder that an adequate supply of binding twine is necessary to a successful harvest of the crop. This led the government to exert pressure which opened the port of Progreso to United States commerce, and a gunboat carried gold to the port to pay for the sisal, so that the danger for a time feared was averted.

A serious shortage of binder twine in Russia resulted from the war conditions and threatened the grain harvest. The supply was purchased largely from American manufacturers. To relieve the situation the Russian government purchased a million dollars' worth of twine, payment being made in New York and transportation arranged by the Russian government.

CHINESE INDIGO. The shortage of the supply of synthetic indigo on the markets of the world as a result of the war in Europe, and the consequent high prices, led to a revival of the native cultivation of indigo in various parts of China. Indigo production is one of China's oldest industries. It continued in some parts in spite of the synthetic product, and foreign dyes were said to be comparatively rare in many districts. Ordinarily, synthetic indigo can be delivered well into the interior of China at lower cost than the native product. In 1913

it was reported that artificial indigo to the value of over \$7,000,000 was imported. In 1915 it was expected that the natural product raised in China would not leave a surplus for export, but a continuation of high prices would lead to a great revival of the old-time industry.

EGGS. The extent to which eggs were imported from China into the United States was surprising. The duty on fresh eggs was removed by the tariff act of 1913 and that on other eggs much reduced. In 1914 the Chinese imports consisted of \$1,089,164 worth of fresh eggs, and over a half million dollars' worth of yolks and frozen eggs. Several of the largest bakers' supply houses of the United States contemplated erecting factories in China to manufacture dried and desiccated eggs. One such plant had already been put in operation.

WEEDS. Attention was called to the alarming spread of weeds in Canada, where it was reported that people had been forced to leave their farms because of the invasion of weeds. The Commission of Conservation explained this by the uncommon difficulties of the climate and the large acreage the farmers were attempting to cultivate with short labor. "In consequence," it says, "we have the largest amount of weeds per acre of any country in the world." The use of various chemicals as sprays in controlling weeds had been tried with success. In view of the drain of weeds on the moisture and fertility of the soil, and the finding that one of the chief benefits of cultivation is keeping down weeds, economical weed control was highly important. Sodium arsenite applied as a spray had been found one of the most effective weed killers, and in some sections had proved an economical and practical success, both in cultivated fields and in ridding grass lands of noxious weeds. The cost of the spray was about \$2.50 per acre. In Hawaii it was used on the pineapple plantations for five years, and on one large plantation resulted in a saving in labor of \$100,000 a year.

UTILIZING WASTE PRODUCTS. A striking instance of the utilization of waste agricultural products was furnished by the case of cherry and apricot pits and raisin seeds. These products, formerly thrown away, were being used on quite an extensive scale for making alcohol, volatile and fixed oils, and other products. About 1600 tons of cherry pits or stones were being produced in the United States annually. The kernels from these yielded approximately 21,000 gallons of sirup from which 5000 gallons of alcohol and 85,000 pints of jelly were made, together with large quantities of volatile and fixed oils. The annual output of apricot pits was some 5000 tons, the kernels of which yielded 350 to 400 tons of fixed oil and 18,000 to 22,000 tons of volatile oil. From the annual crop of 3000 to 4000 tons of raisin seeds were derived large quantities of sirup from which from 41,000 to 54,000 gallons of alcohol were made, and the residues yielded many thousand gallons of fixed oil used for paint and soap making, and 330 to 445 tons of tanning extract, suitable for tanning leather. Refuse tomato seed was utilized in some countries, notably Italy, for the extraction of oil used for soap and other purposes. Waste grape seeds, a by-product of wine making, were likewise used for extracting oil.

INSANITY ON THE FARM. In view of current

opinion regarding the prevalence of insanity on the farm, and especially among farm women, the report of an inquiry into this subject by the United States Bureau of the Census is interesting as furnishing some exact data. The number of insane admitted to hospitals the country over in 1910, per 100,000 population, was 94.3 males and 77.5 females in urban communities, and 45.2 males and 37.3 females in rural communities. This shows the current view to be without foundation.

INTERNATIONAL INSTITUTE OF AGRICULTURE. With the progress of the war the difficulty of carrying on the work of the Institute increased. The delegates from the belligerent countries returned home, and by the time Italy entered the war nearly half of the present staff, ordinarily consisting of about 100 members, had left Rome. Special efforts were made to insure the issuance of the regular bulletins and statistical tables, and it was hoped in this way to keep the current work up to date, with a view to resuming the functions of the Institute with full vigor on the conclusion of peace. Difficulty was experienced in securing crop statistics from the countries at war. The estimates were based to the extent of about 80 per cent on definite returns, the balance being supplied on the basis of averages of previous years and reports of general conditions.

NEW LITERATURE. The following are some of the books of the year: H. J. Waters, *The Essentials of Agriculture* (Boston and London, 1915), a general treatise covering soils and fertilizers, maintenance of fertility, breeds of live stock, the business aspects of farming, and mechanical power on the farm; H. W. Wiley, *The Lure of the Land* (New York, 1915), a popular treatment of some of the principles and practices of the new agriculture, illustrated from the author's experience; C. W. Stoddart, *Chemistry of Agriculture* (Philadelphia, 1915), a book for class-room and reference; E. J. Russell, *Soil Conditions and Plant Growth* (London, 1915), a revised edition of an excellent résumé of the theory of soil management and plant growth; A. H. H. Matthews, *Fifty Years of Agricultural Politics, 1865-1915* (London, 1915), a historical sketch of the efforts of the British Central Chamber of Agriculture to affect legislation respecting agricultural matters; F. I. Anderson, *Electricity for the Farm* (New York and London, 1915); J. B. Morman, *Principles of Rural Economics* (New York, 1915); and F. E. L. Beal, *Some Common Birds Useful to the Farmer* (U. S. Dept. Agr., Farmers' Bul. 630, 1915).

Various cereals, etc., referred to above are treated in separate articles, each under its own name.

AGRICULTURE, INTERNATIONAL INSTITUTE OF. See AGRICULTURE.

AGRICULTURE, UNITED STATES DEPARTMENT OF. See UNITED STATES DEPARTMENT OF AGRICULTURE.

AIRSHIPS. See AERONAUTICS.

ALABAMA. **POPULATION.** The estimated population of the State on July 1, 1915, was 2,301,277. The population in 1910 was 2,138,093.

AGRICULTURE. The acreage, production, and value of the principal crops as estimated by the United States Department of Agriculture in 1914-15 were as follows:

		Acreage	Prod. Bu.	Value
Corn	1913	3,900,000	66,300,000	\$45,747,000
	1914	8,264,000	55,488,000	44,890,000
Wheat	1915	100,000	1,200,000	1,500,000
	1914	81,000	403,000	508,000
Oats	1915	600,000	11,400,000	7,182,000
	1914	390,000	8,580,000	5,920,000
Rice	1915	300	8,000	6,000
	1914	200	6,000	4,000
Potatoes	1915	20,000	1,600,000	1,440,000
	1914	18,000	1,422,000	1,436,000
Hay	1915	250,000	a 362,000	4,489,000
	1914	220,000	288,000	3,974,000
Tobacco	1915	200	b 100,000	22,000
	1914	200	140,000	39,000
Cotton	1915	3,400,000	c 1,050,000	55,734 000
	1914	4,007,000	1,751,000	56,118,000

a Tons. b Pounds. c Bales of 500 pounds gross weight.

MINERAL PRODUCTION. The coal production in the State in 1914 was 15,593,422 short tons, valued at \$20,849,919. This was a decrease as compared with 1913 of 2,085,100 tons in quantity and \$2,223,805 in value. The decrease of the output was general throughout the State. The markets for Alabama coal were affected by the low price of petroleum in the Southern States, by increased water-power development, by the competition of coal from Kentucky and Illinois in the markets of Louisiana and Mississippi, which are normally supplied by Alabama, and by a decrease in the bunker trade, which suffered because of the cutting-down of exports of cotton in the summer. The iron ore mined in the State in 1914 was 4,838,959 tons. The quantity marketed was 4,514,926 tons, valued at \$5,727,619. This was a considerable falling off from the production of 1913, which was 5,333,218 tons, valued at \$6,648,569. Alabama ranks third of the States in the production of iron ore. The total value of the mineral production in 1914 was \$30,879,288 compared with \$39,660,545 in 1913.

FINANCE. At the beginning of the fiscal year, 1914, there was a balance in the treasury of \$99,267. The receipts for the fiscal year amounted to \$6,607,001, and the disbursements to \$6,575,569. The bonded debt of the State at the end of the year was \$9,057,000.

EDUCATION. The total school population of the State in 1915 was 774,976. There was an enrollment of 464,345 in the public schools, and an average daily attendance of 291,890. The total number of teachers, both male and female, numbered 8678. The average salary for male teachers was \$382 per year, and of female, \$312. The total school expenditures for the year were \$4,776,807. The Legislature of 1915 passed a number of important measures relating to education. There was created a commission to be known as the Illiteracy Commission, composed of five persons, including the State Superintendent of Education. The committee was to collect data relating to adult illiteracy in the State, and make recommendation for improvement in the conditions. A second measure authorized women to serve on boards of education in cities, counties, and towns. The employment of public school teachers of less than seventeen years of age was prohibited, and provision was made for schools having less than 10 pupils. Private, denominational, and parochial schools are required to make school reports. A limited compulsory education act was passed. This requires an attendance at school of all children between the ages of 8 and 15, at least 80 days

during each year, with certain exceptions and conditions. Provision was made for the holding of teachers' institutes in the State.

CHARITIES AND CORRECTIONS. The State charitable and corrections institutions include insane hospitals at Tuscaloosa and Mount Vernon, the Confederate Soldiers' Home at Mountain Creek, Alabama Industrial School for White Boys at East Lake, State School for White Girls, State School for the Deaf and Blind at Lineville, Alabama Home for Refuge, Reform School for Juvenile Negro Law Breakers, and the School for the Negro Deaf and Blind. There is no general board supervising these institutions.

POLITICS AND GOVERNMENT. The Legislature met in 1915, and its most important enactments relating to regulation of the liquor traffic are noted below. There was no election of the State officers.

The State became a prohibition State on July 1, 1915. On July 14th the Legislature passed prohibition bills which were vetoed by the Governor. He asked that the prohibition question should be submitted to voters at a special election. Both Houses of the Legislature on January 22nd voted down this proposal and repassed the bills by overwhelming majorities. These measures enacted the Prohibition Act repealed in 1911, after having been in force for two years. In that year a local option law passed the Legislature under which all but 8 of the 67 counties of the State voted dry. Both houses of the Legislature on February 2nd passed, over the Governor's veto, the anti-liquor advertising law designed to prohibit newspapers published in the State from printing liquor advertisements, and to prevent the circulation in the State of papers published outside of Alabama carrying such advertising. This measure also prohibited liquor advertising by circular, bill-board display, or otherwise. This law was upheld by the decision of the Supreme Court rendered on March 26th. The chancellor in his opinion said that the new law would not violate the Federal or State Constitutions or interfere with interstate traffic. It was declared by Judge Miller of the Court of Appeals, however, that newspapers published in other States and sent to Alabama by mail or freight become articles of interstate commerce, and as such could not be interfered with by State authority. A bill authorizing a vote at the next general election on a women's amendment to the State Constitution was defeated in the House of Delegates on August 25th. Fifty-two members voted for the measure and 42 against it; a two-thirds vote was necessary for the passage of the bill. The Senate defeated an equal suffrage measure by a vote of 21 to 10 on September 1st.

STATE GOVERNMENT. Governor, Charles Henderson; Lieutenant-Governor, Thomas E. Kilby; Secretary of State, John Purifoy; Auditor, M. C. Allgood; Attorney-General, W. L. Martin; Adjutant-General, G. J. Hubbard; Treasurer, W. L. Lancaster; Superintendent of Education, W. F. Feagin; Commissioner of Agriculture, J. A. Wade; Commissioner of Insurance, C. B. Smith;—all Democrats.

JUDICIARY. Supreme Court: Chief Justice, John C. Anderson; Associate Justices, Thomas C. McClellan, J. J. Mayfield, A. D. Sayre, Ormond Sommerville, William H. Thomas, and L. D. Gardner; Clerk, Robert F. Ligon.

STATE LEGISLATURE.

	<i>Senate</i>	<i>House</i>	<i>Joint Ballot</i>
Democrats	34	104	138
Republicans	1	2	3
Democratic majority.	33	102	135

ALABAMA, UNIVERSITY OF. A State institution for higher education founded at University, Alabama, in 1831. The total enrollment in all departments in the autumn of 1915 was 1505. The faculty numbered 101. There were no notable changes in the membership of the faculty during the year, and no noteworthy benefactions were received. The university is supported almost entirely by legislative appropriations. The library contains about 45,000 volumes. The president is G. H. Denny, LL.D., D.C.L.

ALASKA. The year 1915 has been one of increasing prosperity and of great economic advances for this vast Territory. In minerals, gold and silver products have increased, the copper product quadrupled, and coal lands surveyed for lease and entry. Fisheries flourished, and aids to navigation were largely installed. The government railway has been put under construction. Education and supervision have improved the conditions of natives, who can now become citizens or organize self-governing towns. The Legislature has enacted laws which deal with modern life as broadly and fully as any of our States.

POPULATION AND TOWNS. The population is estimated at 70,000, of whom 44,000 are whites. The following show the assessed value and per cent of taxes in towns in 1914: Juneau, \$2,852,000, 2.5; Fairbanks, \$2,829,403, 1.5; Nome, \$1,683,564, 1.5; Ketchikan, \$1,040,175, 1.25; Seward, \$929,960, 0.8; Cordova, \$917,770, 0.6; Valdez, \$750,000, 1.5; Skagway, \$610,215, 1.0; Douglas, \$542,205, 1.0; Wrangell, \$200,227, 1.5; Petersburg, \$190,975, 1.5.

LAWS. The Legislature met March 1, 1915, and enacted timely laws of special importance. Among others were the following: Granting citizenship to natives free from tribal relations; according self-government to villages of 40 adult Thlinget, Tsimpscan, or Hyday natives; excluding minors from pool-rooms, etc.; punishing white slavery and seduction; inhibiting liquor sales to natives; extending the eight-hour law to placers, etc.; protecting wild game; providing for education, roads, and revenues; a workman's compensation law surpassing in liberality that of any other State. Referendums were authorized at the next general election as to a general eight-hour law, and for complete Prohibition on Jan. 1, 1918, of sale or manufacture of liquor.

MINERAL PRODUCTION. Data as to the most extraordinary productivity during 1915 in mineral outputs have been drawn from the preliminary report, dated Jan. 1, 1916, of Mr. Alfred H. Brooks, Chief of the Alaskan Division, United States Geological Survey. The figures, it is believed, will not vary over 5 per cent from the final revision. The value of the mineral products in 1915 far exceeds that of any previous year, aggregating \$32,000,000 and exceeding by 68 per cent the output of 1914, which amounted to \$19,064,963. The earlier maximum production of \$23,378,428 was in 1912, when the bonanza placers of Fairbanks and of Nome were at the height of their productivity. Practically 90 per cent of the increase of 1915

was due to the copper output which rose in value from \$2,852,934 in 1914 to \$14,400,000 in 1915. There was a small increase in gold production, from \$15,026,813 in 1914 to \$15,900,000 in 1915. It is the largest annual output of gold since the record maximum of \$17,145,951 in 1912. Silver values rose from \$218,327 in 1914 to \$400,000 in 1915. Tin, antimony, coal, petroleum, etc., increased from \$222,802 the previous year to \$300,000 in 1915. The vast increase in the total mineral output of 1915 is not due to a temporary expansion of the mineral industry, or to stimulation from urgent market demands. It is the natural outcome of pioneer work on mines not previously developed to the producing stage. The current production is precursory to similar increases in the future output of both copper and gold lode mining. Gold placers and coal seams await transportation for fuller development. To date the mineral production of Alaska aggregates in value \$300,000,000, divided as follows: Gold placers, \$186,200; gold lodes, \$74,850,000; copper, \$34,150,000; silver, about \$2,650,000; tin, petroleum, coal, etc., about \$2,150,000.

Gold Mining. The placer gold of 1915 is valued at \$10,500,000, a decrease of \$230,000 from 1914. It is believed that the current decrease in the Yukon camps will be fully offset in coming years by important developments in the Tolovana district, northwest of Fairbanks. The number of working dredges, 42, remains unchanged. While productive gold lode mines decreased from 28 to 23, yet the output rose from \$4,863,028 in 1914 to \$6,200,000 in 1915. The increase was in the Juneau district, where steadily enlarged outputs may be expected for many years. Conditions of placers by the principal districts are as follows: The products of the camps in the Yukon basin were \$7,795,421 in 1914; they decreased about \$500,000 in 1915. Fairbanks from 115 placers obtained \$2,450,000 in 1915 as also in 1914. Innoko with 38 mines, and Iditarod with 31 placers produced about the same in 1914 and 1915. The yield of Hot Springs from 30 placers was about \$550,000 in 1915. Koyukuk increased from \$260,000 in 1914 to \$300,000 in 1915. The Kenai and Susitna regions report about \$500,000, an increase of \$100,000. There were substantial gains in Seward Peninsula, \$2,900,000 in 1915, against \$2,700,000 in 1914.

Copper Mining. There was produced in 1915, from 14 mines, copper to the amount of 83,850,000 pounds, valued at \$14,400,000, as against 21,450,628 pounds and \$2,852,934 in 1914. In the Ketchikan district 7 mines produced 4,500,000 pounds. The four mines in the Prince William Sound region showed slight gains. In the Chitina district the Bonanza and Jumbo mines increased their output enormously, while large amounts came from Mother Lode, despite its location, which entails 14 miles of sledding to the railroad. While high prices caused the reopening of a few small copper mines, the main development was normal.

Miscellaneous. The output of tin has materially increased, mainly from the York district, Seward Peninsula, from which came the greater part of the 200 tons of stream tin in 1915. A new source of Alaskan mining has been developed from the stibnite ores of Seward Peninsula and of Fairbanks, from which in 1915 antimony was obtained to the value of \$70,000.

The coal conditions are yet unsatisfactory, as importations were necessary to the value of \$400,000. Relief is, however, in sight. Surveys of the more accessible parts of the coal areas have been made in the Bering River, Matanuska, and Nenana districts, and leases will soon be available. Permits for free mining on areas under 10 acres have been made, and in 1915 patents for three sections of coal lands were issued.

AGRICULTURE AND HOMESTEADS. The national experimental stations have materially improved and stimulated agriculture. The station at Sitka fosters horticulture; Rampart devotes its efforts to grain, breeding, and forage plants, with success; Fairbanks continues demonstration work to the advantage of the farmers of the Tanana Valley; Kodiak is developing stock-raising and dairy-farming, hampered by the law-protected and marauding brown bear. Skagway and Fairbanks by annual fairs display the wealth of Alaskan farm products. Only 50,000 acres of land have been patented during 1915. The expensive and obligatory survey at private expense, and restrictive regulations discourage homesteading, except in national forests. Despite these conditions hundreds of homesteads were located in 1915, both on surveyed and on unsurveyed lands. The Governor estimates that there are 50,000,000 acres of land suitable for agriculture: large areas are in the Matanuska and Susitna valleys, which will soon be accessible by the railway under construction.

COMMERCE. The total trade, including minerals, to and from Alaska during the fiscal year ending June 30, 1915, was valued at \$70,113,916, an increase of \$9,037,692. For the nine months ending Sept. 30, 1915, the increase was 12 per cent over the same period in 1914. In the fiscal year 1915 the shipments into Alaska aggregated \$20,792,609, of which 29 per cent were in foodstuffs. Despite a steadily increasing white population the shipment of liquors has decreased from \$722,000 in 1913, to \$555,000 in 1915. A notable decrease from 1914 to 1915 is that of 8 per cent in potatoes, due to the improved farming of the Territory. It is of interest to note that the exportation from Alaska of salmon in 1915, valued at \$18,375,000, exceeded by \$3,026,000 the entire shipments of domestic gold and silver.

FISHERIES. See article FISH AND FISHERIES.

FUR SEALS. The provisions of the North Pacific Pelagic Sealing Convention of July 7, 1911, remain in force and are quite efficiently maintained. Sealing on the Pribilof Islands is prohibited, by the act of Congress of Aug. 24, 1912, until the year 1917. In January, 1915, the commission of experts—Osgood, Parker, and Preble—made a full report as to conditions, remedies, etc., of the seal herds of the Pribilofs. In 1914 the herd consisted of approximately 294,700 animals, of which not less than 93,250 were females of breeding age. By August, 1915, they had increased to 360,000, of which not less than 103,000 were females. On these reports it is expected that Congress will be able to legislate on data fully reliable. Some 3500 seals were killed in 1915 as a food supply for the natives during the coming winter. Secretary of Commerce Redfield plans to develop a new American industry for the dressing, dyeing, etc., of the seals, and also to utilize the seal-bodies now wasted.

FUR-BEARING ANIMALS. An inter-departmental board has considered the anomalous and con-

fusing systems of control over the fur-bearing animals of Alaska—entrusted to several different departments. Under existing law, for instance, the black bear is under the Department of Commerce, while the brown bear is entrusted to the Department of Agriculture. The board recommended legislation by Congress to give the Department of Agriculture control over all terrestrial fur-bearing animals, and that the Department of Commerce should "exercise exclusive jurisdiction over fisheries, fur seals, sea otters, walrus, sea lions, whales, porpoises, and other aquatic mammals." See also *FUR*.

EDUCATION. There were maintained 47 public schools with 2503 pupils: of these 14 schools and 1542 pupils were in, and provided for by, incorporated towns. The Legislature has provided for educational facilities, and it enacted two laws for the complete coordination of the conflicting systems. As they are considered to be beyond the legislative powers these laws await the action of Congress. The schools of the United States Bureau of Education are mentioned under *Natives*.

FORESTS. The national forest reservations remain unchanged, except that a considerable area of the Chugach forest has been restored to the public domain. After paying all expenses from the receipts of \$47,366, there remained a net income of \$7164. Applications for permission to make homestead entries in these forests have largely increased, and there were in 1915 100 pending cases for Tongass and 188 for Chugach forest. See also *FORESTRY*.

REINDEER. From year to year reindeer become more important to the natives. Their value increases with the gradual transformation of the hunting natives—previously migratory from Point Barrow to the Alaskan peninsula—into settled stock-growing communities. The herds on June 30, 1914, aggregated 57,782 head, which through the average annual increase of 20 per cent should approximate 70,000 in number on June 30, 1915. Two-thirds of the deer are in the hands of natives, who in 1914, to the number of 980, owned 37,828 reindeer, valued at \$945,700, and furnishing an income—exclusive of domestic uses—of about \$78,000 annually. The herds near Bethel aggregate 8500 head, and at five other places number between two to four thousand deer. Small herds have been sent to the islands of Amakmak, Atka, Annette, and Umnak.

NATIVES. About 15 per cent of the natives are reported to be tuberculous, and various epidemics are reducing their number. The Alaskan Legislature of 1915 memorialized Congress to make suitable provisions for their medical relief. The natives of Southeastern Alaska are generally industrious and self-supporting. The Governor of Alaska reports that the reservation of the Aleutian Islands as a game preserve has injuriously affected the natives and by denying employment in fisheries, etc., has reduced them to "actual want, even starvation." The Eskimo, some 5000, of the Yukon and Kuskokwim deltas, are deteriorating from illicit liquor traffic, and lack the practical education and industrial training which would improve their material condition. Thousands of natives elsewhere are receiving practical instruction through the 67 schools of the United States Bureau of Education, in which about 3500 pupils are enrolled. By the teachers sanitary methods are enforced, indus-

tries promoted, and individual responsibility stimulated. Gardens, libraries, village councils, school republics, clubs, shop-work, and entertainments are methods used. Coöperative stores have been successfully conducted by natives at Atka, Hydaburg, Klawock, Klukwan, and St. Lawrence Island. Recent legislation renders possible citizenship for natives, and self-government for their communities. Reservations for such villages have been made on Kobuk River and at Tyonek, Cook Inlet. On Jan. 28, 1915, the Secretary of the Interior promulgated regulations for the self-government of the Metlakatla Indians, on Annette Island reservation, which will be the model for the control of other similar communities. The officers of the Public Health Service, with inadequate force and insufficient funds, have struggled with the medical care of thousands of sick natives. In addition to the small hospitals at Kotzebue, Nulato, and Nuahugak, there are doctors and nurses at Nome, Russian Mission, Seward, and Sitka. Contract service is had from several hospitals elsewhere. Complications have arisen regarding the Metlakatla Indians, and congressional action has been recommended by Secretary of the Interior Lane to definitely fix their status, so that they may acquire citizenship, own land in severalty, and have such advantages as other Indians in Alaska, as to education, self-government, etc.

ROADS AND RAILROADS. The railway mileage remains unchanged at 446 miles, of which there have been operated only the following: White Pass and Yukon, 21 miles; Yakutat and Southern, 9 miles; Tanana Valley, 46 miles; and the Copper River and Northwestern (Cordova to Kinneceutt), 195 miles. The Alaska Northern has been bought by the United States, and construction work begun (about 15 miles completed) on the government branch from Anchorage, Knik Arm, up the Matanuska Valley. The Board of Road Commissioners, United States army, had completed up to June 30, 1915, an aggregate of 3695 miles of roads, etc., divided as follows: 902 miles of wagon roads, 577 miles of winter sled-roads, and 2216 miles of trails. Land travel is now practicable at all seasons of the year from Valdez northwards to Kotzebue Sound, and the upper Koyuk Valley. The winter mail even reaches extreme Northern Alaska, Point Barrow, on the coast of the Arctic Ocean.

GEOLOGIC SURVEYS. In 1915 the United States Geological Survey covered about 20,000 square miles of Alaska, 9000 miles being geologic work and 11,000 square miles topographic.

COAL PERMITS. Under the provisions of the regulations of the United States Commissioner of Public Lands of Dec. 30, 1914, several local permits have been issued for the free mining of coal lands of 10 acres or less.

TELEGRAPHS. The military telegraph system, extending by cable to Sitka, Juneau, and Valdez, reaches nearly every town as far as Nome to the west and Circle City to the east. The rates were lowered 25 per cent in 1915, and night service instituted for domestic messages at reduced rates. The naval wireless system reaches Sitka, Cordova, and the Pribilofs.

AIDS TO NAVIGATION. Most successful efforts have been made during 1915 to increase safety of navigation in Alaskan waters. Up to November 30 there had been established, during the year, 46 aids (beacons, buoys, and lights). The more important are the 24 flashing acetylene

lights, located as follows: Lewis Reef, Tongass Narrows; Narrow and Middle Points, Clarence Strait; Point Alexander, Wrangell Strait; Mar-mion Island and Sheep Creek, Gastineau Channel; Clear Point, Barlow, Naked, and Little Islands, and Low Point, Lynn Canal; Kingsmill Point, Point Augusta, Hawk Inlet Entrance, and East Shoal, Chatham Strait; Otsoia Island, and McClellan Rock, Peril Strait; Anchor and Race Points, Flat Island, East Chugach, and East Forelands, Cook Inlet; and Point Romanoff, Norton Sound. Good progress was also made in the construction of the new light and fog-signal at Cape St. Elias, Kayak Island, for which \$115,000 was appropriated by Congress Oct. 22, 1913.

CONGRESSIONAL LEGISLATION. During the year 1915 legislation has been principally confined to the making of appropriations. Since the national administration adopted the policy of developing Alaskan resources, the necessity has been recognized of reforming and modifying existing governmental methods so as to ensure efficiency. Secretary of the Interior Lane has analyzed current administrative regulations, and the summary thereof discloses amazing conditions of delay, extravagance, and inefficiency. To acquire a homestead, for instance, requires the expenditure by the applicant of hundreds of dollars for surveys, etc., while periods ranging from two to seven years elapse before the final patent issues. A fox farmer, under advice, sought to obtain a lease from three different departments in turn, only to be informed that no one had power in the case. Revenue taxes levied by the Alaskan Legislature clash with national powers. The school systems are conflicting and in an inchoate condition, as are other interests of the general public. Early congressional legislation is imperative. To remedy the more striking defects it has been suggested that the President be empowered to appoint, subject to confirmation by the Senate, a Development Board, which should be resident in Alaska and be charged with the control of the greater part of national affairs. Meantime Alaska asks that Statehood be granted to the Territory.

ALBANIA. Nominally an independent country; formerly a region of European Turkey, consisting of the vilayets of Scutari and Janina, and of parts of Kossovo and Monastir. Albanian independence was proclaimed at Valona Nov. 28, 1912, and on the 20th of the month following the London Ambassadorial Conference agreed to the principle of Albanian autonomy. Under the treaty of London of May 30, 1913, Albanian boundaries were left to the decision of the Powers. On Feb. 23, 1914, Prince William of Wied accepted the crown of Albania, offered to him by an Albanian deputation, ascended the throne March 13, and in the following September left the country. Thereupon Essad Pasha, who had been expelled from Albania in May, returned and made an unsuccessful attempt to set up a military government. Anarchy ensued.

The provisional frontiers of the country would have embraced an area of about 10,800 square miles, with a population of about 850,000. This area has been encroached upon, from the south, by the Greeks. Of the inhabitants, Mohammedans are estimated to number 590,000, Orthodox 140,000, and Roman Catholics 120,000. Estimated population of towns: Durazzo (the provisional capital), 5000; Scutari, 35,000; El-

basan, 13,000; Argyrocastron, 12,000; Tirana, 12,000; Berat, 8500; Korytza, 8000; Valona, 6500.

HISTORY. After the prudent but inglorious retirement of the Prince (Mpret) William of Wied (a German princeling who had been placed upon the throne by the Powers in 1913, see the YEAR BOOK for 1913 and 1914) from the turbulent Principality of Albania, the government fell into the hands of Essad Pasha, who had formerly held the portfolios of war and the interior in William's cabinet, and had subsequently been exiled as a traitor to his sovereign. Returning in triumph after the flight of the Prince, Essad seized the government and declared that he would hold Albania in trust for Burhan Ed-din, a younger son of ex-Sultan Abdul Hamid. Essad, however, found it extremely difficult to retain the loyalty of his Mohammedan supporters, since his own sympathies were with Italy and Serbia, whereas the Mohammedans of Albania in large part espoused the cause of the Central Powers at whose side Turkey was fighting. Unrest caused by the scarcity of food supplies and local disturbances, which the government was powerless to prevent, had before the close of the year 1914 furnished Italy with an excuse for the occupation of Avlona and given Greece a pretext for the seizure of Albanian Epirus. All these circumstances contributed to swell the current of discontent in Albanian politics and led directly to the outbreak of rebellion in January, 1915. Up to the very gates of Durazzo the rebel forces surged, demanding the retirement of Essad Pasha, the reversal of his pro-Serbian and pro-Italian policies, and the surrender of the Serbian and Italian envoys at Durazzo. Terrified, Essad Pasha appealed to Italy for aid in defending himself against the rebels. In response to his appeal, Italian warships, which had been detailed to watch the Albanian situation, directed their guns against the rebels and repulsed the attack on Durazzo. In view of the critical situation, Italy landed more troops on the Albanian coast, and Greece hurried a warship to protect the numerous Hellenic inhabitants of Durazzo. By recalling the warship, shortly afterwards, the Greek government recognized Italy's predominant interests in the northern part of Albania.

In February a large force of Albanian insurgents crossed the frontier into Serbia, near Prizrend, and occupied Zapod, Topliana, Glavotchnitch, Vrbnitza, Jour, and Vranichte. Sympathetic observers interpreted the incident as an indication of Albanian nationalism, which aspired to reunite with Albania the Albanian populations of Prizrend, Prishtina, Mitrovitza, Uskub, Dibra, Struga, and Ochrida, chafing under Serbian rule, in addition to Jakova and Ipek, recently annexed by Montenegro. The Serbian government, however, regarded the irregular Albanian invasion of Serbia as an act of wanton aggression which would fully justify a retaliatory Serbian invasion of Albania. The Albanian rebels, it was alleged, were being supplied with arms and incited to attack Serbia by agents of Austria. Serbia must therefore take measures to pacify her Albanian frontier. Accordingly Serbian troops crossed over into Albania from Ochrida, in Southwestern Serbia, and advanced in the direction of Elbassan. After defeating an Albanian force at Krakew, the Serbs entered Elbassan, June 3d, and pressed on to Tirana. There they were met by Essad Pasha,

who had held out against the rebels at Durazzo and had finally driven them off, although on more than one occasion his palace had been damaged and he had stood in imminent danger from the rebel artillery. The amicable relations between Essad Pasha and the invading Serbs was strikingly manifested when Essad joined the invaders and the Serbian commander issued a proclamation announcing his intention to punish the insurgents who had rebelled against Essad Pasha and promising to withdraw from Albania as soon as "Albania's son" (Essad Pasha) had been firmly reinstated. "We bring peace and love," declared the Serbian leader, "to all who are with us, and against those who are opposed to us we draw the sword."

While the Serbian army invested Durazzo and temporarily opened Serbia's long-coveted "window on the Adriatic," Montenegrin forces invaded Albania from the north and won back for King Nicholas the prize of which Austria had deprived him in 1913. In view of the fact that other Powers had occupied other parts of Albania, Montenegro felt warranted in reconquering the important town of Scutari in Northern Albania, June 27th. The Montenegrin commander, General Vukotich, lost no time in arresting the Austrian agents who, according to the Montenegrins, had generously supplied Albanian nationalists with arms, money, and grievances for attacks on Montenegro. Large quantities of ammunition of Austrian origin were reported to have been confiscated in Scutari by the Montenegrin authorities. While Serbian and Montenegrin forces were taking possession of parts of Albania, the Italian press manifested some concern lest Italian interests might be injured. In July, however, Montenegro promised to submit her Albanian claims to the decision of the Entente Powers, and in the following month Premier Pashitch of Serbia was quoted in an important interview by the *Corriere della Sera* to the effect that Serbia would fully recognize Italy's dominant interests in the Adriatic littoral.

In December, as a result of the Austro-German-Bulgar campaign in Serbia, some remnants of the Serbian armies, accompanied by throngs of homeless and terror-stricken Serbian peasants, sought refuge in Albania. The scarcity of food and the prevalence of disease in Albania were consequently still further aggravated. In December also the Italian government landed some thirty thousand troops in Albania. This step was heralded in the press as a loyal effort to succor Serbia; quite possibly, however, Italy's action was calculated solely to strengthen her hold upon the coveted coast of Albania. Just at the close of the year it was reported that a Bulgarian army, pursuing the Serbians into Albania, had captured the Albanian town of Elbasan. Consult article on the WAR OF THE NATIONS.

ALBEE, JOHN. American author and poet, died March 24, 1915. He was born at Bellingham, Mass., in 1833, and graduated from Phillips Academy, Andover, in 1854. He studied theology at the Harvard Divinity School in 1858. During his student days he was a frequent visitor at the home of Ralph Waldo Emerson at Concord. He was also an intimate friend of the Alcotts and Thoreau. For many years he lived at New Castle, N. H. He wrote much in prose and verse. Among his writings are: *Literary*

Art (1881); *Poems* (1883); *History of New Castle* (1884); *Prose Idylls* (1892); *Remembrances of Emerson* (1900); and *Confessions of Boyhood* (1910).

ALBERT, KING OF BELGIUM. See BELGIUM and FRANCE, *History, passim*.

ALBERTA. A province of the Dominion of Canada, between Saskatchewan and British Columbia. Capital, Edmonton. Area, 255,585 square miles. Population, according to the census of 1911, 374,663, the increase over 1901 being 413.1 per cent. In 1911, Edmonton had 24,900 inhabitants; Calgary, 43,704; Lethbridge, 8050. These towns have since greatly increased in population. The provincial government is under a lieutenant-governor, appointed by the Governor-General of the Dominion. He acts through an executive council, or responsible minority of eight members. There is a unicameral legislative assembly of 56 members elected by direct vote for five years. Lieutenant-Governor in 1915, Robert George Brett, succeeding George Hedley Vicars Bulyea. Premier in 1915, A. L. Sifton. See CANADA.

ALCOHOL. The European war has been the occasion of a great deal of discussion as to the effects of alcohol in relation to the soldiers. Early in the war, as noted in the 1914 YEAR BOOK, all of the contending nations took more or less severe measures against the production and consumption of alcoholic beverages. The evidence is overwhelming that the use of alcohol, even in small amounts, impairs muscular co-ordination, dulls the mind and special senses, and reduces efficiency in work demanding rapid and accurate mental or physical effort. The military authorities in Europe, however, evidently think that the soldier in the field needs some stimulation in times of unusual stress, strain, and exposure, and that it compensates in its stimulating effects enough to counterbalance its admitted disadvantages. The *British Medical Journal*, in discussing the question, gives the amount of alcohol allowed by the army regulations of various countries. The English army ration allows each man two and a half ounces of rum twice a week, while in the trenches the men are allowed three ounces twice a week in ordinary weather, and two and a half ounces daily in bad weather. This is a minimum of five ounces a week and a maximum of seventeen and a half ounces. Two and a half ounces of rum is estimated to contain 25.5 grammes of alcohol. In the French army each soldier is allowed daily 50 grammes of rum, an equivalent of 20 grammes of alcohol. The German soldier has a daily allowance of 1793 grammes of beer and 20 grammes of brandy, equivalent to 70.7 grammes of alcohol. The Austrian soldier receives daily one-half litre of wine, equivalent to about 40 grammes of alcohol.

One of the unfortunate effects of the suppression of the manufacture of vodka in Russia, according to the *Policlinico* of Rome, is that lotions and medicines containing alcohol and denatured alcohol are being consumed in large amounts since the supply of liquor has been cut off. As a consequence a number of deaths have occurred from poisoning and it was deemed necessary to issue a decree that no remedies containing alcohol may be sold without a physician's order. This decree met with such a storm of protests that it was rescinded and a new order issued to the effect that not more than 30

grammes of any medicinal preparation containing alcohol could be sold to one person. Kuznetsoff states that after the prohibition of the sale of vodka in Russia last August, cases of poisoning from denatured alcohol, varnish, and other substitutes for the Russian whiskey began to crowd the hospitals. At Petrograd the number admitted to one large hospital had reached 1292 by the end of the year, including 861 cases of poisoning from denatured alcohol, 382 from varnish, and 48 from both combined. There were 11 deaths. The cases are classified by trade or profession, and Lukin discusses the pathologic and anatomic findings.

Under a decree of June 30th, Austria has prohibited the establishment and operation of new non-agricultural distilleries of alcohol, which are subject to a consumption tax under the laws of 1888 and 1889. The construction and operation of new alcohol refineries is likewise prohibited, and no enlargements may be made which would result in increased production.

Lambert, in considering the reasons for the relapses of periodic drinkers, is inclined to believe that these cases are really victims of nicotine poisoning and this is seen most frequently among cigarette smokers, who inhale the smoke. He explains the sequence of events somewhat as follows: tobacco at first is used to soothe the nerves, and for stimulating the circulation and quickening the cerebral action. It apparently increases mental activity in the early stages of moderate indulgence, and it becomes at length a panacea for the small worries and disturbances of daily life. Soon we have the usual evidence of habit formation, the individual being contented and soothed during the period of indulgence, but nervous and unstrung at other times. Finally the narcotic effect is lost and the patient turns to alcohol as a substitute, and such an occasion usually ends in a spree. With returning sobriety both the alcoholic and tobacco poisons are eliminated, but the victim soon begins smoking again as the less harmful habit. Lambert is convinced that the majority of periodic drinkers are subjected to double narcotic poisoning and if they are made to stop smoking the alcoholic craving ceases automatically. See *INSANITY; OCCUPATIONAL DISEASES*.

ALDRICH, NELSON WILMARTH, former United States Senator, from Rhode Island, died April 16, 1915. He was born in Foster, R. I., in 1841. His career began as a clerk in a wholesale grocery store in Providence. He was successful from the very beginning of his commercial life. His business career was interrupted in 1862, when he enlisted as a private in the tenth Rhode Island infantry. After the expiration of his term of nine months, he returned to Providence, and became a partner in the wholesale grocery firm in which he had formerly worked. He was made a member of the City Council of Providence, and at once showed remarkable adroitness in politics. In 1875 he was elected to the Rhode Island House of Representatives, and in the following year became speaker. By that time he was a power in the politics of his State. Elected representative to Congress from the first district of Rhode Island in 1878, he served two terms, resigning in 1881 to take the position in the Senate left vacant by the death of Gen. A. E. Burnside. He was successively reelected to the Senate in 1886, 1892, 1898, and 1905, thus serving as senator from Oct. 5,

1881, until Mar. 3, 1911. It was not until he had been a member of the body for at least ten years that his power began to be felt. In 1883, when a measure for the revision of the tariff act came before Congress, Senator Aldrich gave first expression to what might be termed a New England idea in regard to tariff revision. Later it became known as the "Aldrich Idea." This idea was that the tariff should be made as high as possible. In 1890, when the McKinley bill was before Congress, Senator Aldrich was chairman of the committee. When it was reported out of this committee even its author could hardly recognize it, for in almost all important items the tariff had been made higher. In spite of this the bill was passed, and was signed by the President. Aldrich bitterly opposed the Wilson tariff bill, in 1896 and 1897. By this time it had become recognized that he was one of the most important figures in the Senate. It was said of Aldrich that he paid no attention to what was printed about him, that he denied nothing, and admitted nothing. After his entrance into public life, chiefly through investments in Rhode Island traction companies, he became a rich man. During the passage of the Payne-Aldrich tariff law charges were made that items in which the chairman of the Finance Committee was interested received more consideration than others affected by the bill. For once Aldrich was aroused, and made a categorical denial. In the Senate he, with Joseph G. Cannon of Illinois in the House, formed the bulwark of high tariff, which long stood against every attack of the reform element. Senator Aldrich was greatly interested in financial measures, and had a large part in the preparation of the Aldrich-Vreeland Currency Law. His power as a party leader was so great that he was known as the "Republican Boss of the United States." This power continued until a wave of insurgency overwhelmed the conservative group in Congress, and it was the clash between the ideas of party managers, and principally between the ideas of those led by Aldrich and Cannon and those advanced by the insurgents, that caused the split out of which grew the Progressive Party. Senator Aldrich declined renomination on the expiration of his term in 1911. He declared that he wished to devote his time to the work of the National Monetary Commission, of which he had been made chairman upon its organization in 1908. As chairman he directed a comprehensive investigation of American and foreign banking and currency systems, with the view of reforming the banking system of the United States. In 1911 he made public a tentative scheme designed to increase the effectiveness of bank reserves through their control by reserve associations. The scheme was endorsed by most monetary specialists, but owing to the fact that he was widely regarded as the agent of highly protected interests, it was not received with much popular approval. After his retirement from the Senate he spent most of his time in his country home at Warwick Neck on Narragansett Bay.

ALEXANDER, GEORGE, American Methodist Episcopal clergyman and editor, died Sept. 7, 1915. He was born in Scottsville, Ky., in 1852, and graduated from the University of Louisville in 1871. From 1871-73 he was tutor in the University of Louisville, and from 1873-75 professor of Latin and Greek at Warren College, Ky. After studying at Drew Theological Seminary,

and after pastorates at Lake Mohonk, N. Y., and elsewhere, in 1877 he joined the Louisville Conference of the Methodist Episcopal Church South, and was a pastor in Kentucky from 1877 to 1884. Returning from a year spent in Europe, he became professor of New Testament Greek and Exegesis in Vanderbilt University, holding this position until 1902, when he became presiding elder in Louisville. From 1906 until his death he was editor of the *Methodist Review*, and book editor of the Methodist Episcopal Church South. He was a delegate to many conventions, and took part in the most important movements of his church. He received honorary degrees from Emory and Henry College. His published writings include: *A History of the Methodist Episcopal Church South* (1894); *The Beginning of Methodism in the South* (1897); *The Son of Man—Studies in His Life and Teachings* (1899); and *New Study of the Resurrection of Jesus* (1913).

ALEXANDER, JAMES WADDELL, former life insurance official, died Sept. 21, 1915. He was born in Princeton, N. J., in 1839. When he was still a boy his family removed to New York City, where his father became pastor of the Fifth Avenue Presbyterian Church. The young man met Henry B. Hyde, the founder of the Equitable Life Insurance Society, and the friendship which followed resulted in the close business relations which existed between the two men up to the time of the death of Hyde in 1899. Mr. Alexander graduated from Princeton in 1860, and afterwards studied law. In 1859 Mr. Hyde took the first steps toward the founding of the Equitable Life, and in 1866 Mr. Alexander became secretary of the society. He was elected president in 1899. Soon after the death of Mr. Hyde he was made one of the trustees of his 501 shares of Equitable stock. Shortly after the death of his father, James Hazen Hyde became first vice-president of the society. A controversy between him and Mr. Alexander began and continued for five years, when it was ended by the investigation of the insurance companies carried on by Charles E. Hughes. In February, 1905, Mr. Alexander issued a petition calling for Mr. Hyde's withdrawal as candidate for reelection for the vice-presidency of the company and calling also for a mutualization of the company. A compromise was reached and Mr. Hyde and Mr. Alexander were reelected. The mutualization plan, however, met with delay. Mr. Alexander then began a publicity campaign against Mr. Hyde, and the latter retorted with charges against Mr. Alexander. The State Superintendent of Insurance was at last forced to investigate the society, and the board of directors also began an investigation, which resulted in the condemnation of both Hyde and Alexander. Nearly all the directors resigned, and the business of the society was almost at a standstill when Thomas F. Ryan bought Mr. Hyde's majority stock for \$2,500,000, and both Hyde and Alexander resigned. Nearly all Alexander's very large fortune was used up in settling claims arising from insurance affairs. After his business difficulties, he lived quietly at his summer home until his death. He received the degree of LL.D. from Princeton University, of which he was a trustee.

ALEXANDER, JOHN WHITE. American artist, died May 31, 1915. He was born in Allegheny City, Pa., in 1856. At the age of six-

teen he removed to New York City, where for three years he worked in the art department of Harper & Brothers as an illustrator. He went abroad in 1877 and studied at the Munich Royal Academy, and later in Venice, Florence, Holland, and Paris. On his return to the United States (1881) he at once won recognition as a portrait painter, and many eminent men sat for him, among them Walt Whitman, Joseph Jefferson, Oliver Wendell Holmes, John Burroughs, Grover Cleveland, Robert Louis Stevenson, and E. L. Lewis. In 1891 he became ill and went abroad for his health; visited Spain and Morocco; and in the course of his travels made a series of the portraits of distinguished writers. He exhibited in Paris for the first time in 1893, and this was the beginning of his international fame. Three portraits of women which he sent to the Salon were accepted. Because of the merits of these portraits he was elected an associate of the Société National des Beaux-Arts. The following December he exhibited two pictures at the Grafton Gallery in London, and there won new honors. Mr. Alexander also did distinguished work in mural painting. The six panels in the Congressional Library in Washington are representative of this phase of his art. He was one of the most active members of the National Academy of Design and was, from 1909 until his resignation shortly before his death, president of that institution. In 1909 he received the degree of LL.D. from Princeton University, and he also received medals and other marks of distinction at exhibitions at home and abroad. His pictures hang in some of the most important galleries of Europe and the United States. A public-spirited citizen, he was a trustee of many institutions in New York. He was, also, a member of the National Institute of Arts and Letters.

ALFALFA. Climatic conditions in 1915 were generally favorable to the growth of alfalfa in all the important alfalfa producing countries of the world, but the harvest of the hay was interfered with to some extent, especially in the United States, by periods of rainy weather. The world's acreage devoted to the crop, as indicated by reports, was increased mainly in North and South America, and principally in the United States and Argentina, the two countries in which alfalfa culture is assuming highly important proportions. Statistics on the world's production or on the yields by countries and states are not generally available. In the United States reports showed that Kansas, Nebraska, California, and Colorado continued to be the leading alfalfa producing States. In Kansas the acreage increased from less than 35,000 acres in 1891 to approximately 1,200,000 acres in 1915. Nebraska also reported an area of over 1,000,000 acres devoted to the crop the past year. The production in each of these two States was estimated at about 2,500,000 tons of hay. Among the Eastern States New York again held first place in alfalfa hay production. It was estimated that over 7,000,000 acres of alfalfa are now grown in the United States, and that the hay yield is approximately 18,500,000 tons annually. The alfalfa seed crop of 1915 was produced principally in Utah, Kansas, Nebraska, California, Arizona, Oklahoma, Idaho, and Montana. The annual yield of seed in the United States is reported as ranging at present from 350,000 to 375,000 bushels. The choicest

seed, or seed given preference by many buyers, is produced in Montana and other parts of the northern Great Plains regions.

Experience during the past year gave further proof that alfalfa is not successful under arid or semi-arid conditions when grown in the ordinary way, but that it requires seeding in rows and cultivation during the greater part of the growing period. From some localities in the Southern States alfalfa grown in a mixture with orchard grass was reported as giving a high tonnage per acre, preventing lodging of the alfalfa and furnishing in the hay a better balanced ration than either grown alone. For this purpose 15 pounds of alfalfa seed and 28 pounds of orchard grass seed were sown per acre. Work conducted at the California Agricultural Experiment Station showed that silage may be made from weedy alfalfa not well suited for hay, and that such silage can be used profitably as a supplementary feed for fattening steers on alfalfa hay and barley. In feeding trials by the Nebraska Agricultural Experiment Station, a ration of corn and alfalfa hay produced the cheapest gains of any ration used, and the steers fed corn and alfalfa hay gained as rapidly as the steers on any of the other rations in the comparison.

ALGERIA. A north African country, called a colony but regarded administratively as an integral part of the French Republic. Algiers is the capital.

AREA AND POPULATION. Area by departments, European and native population (1911 census), and total density per square kilometer, are shown below:

Department	Sq. Kms.	Europeans	Natives	D.
Algiers	54,540	271,767	1,421,819	31
Constantine	87,302	155,654	1,945,443	24
Oran	65,897	319,089	892,212	19
Algeria proper	207,789	746,510	4,259,474	24
Southern Territories.....	367,550	5,533	481,052	1
Total	575,289*	752,043	4,740,526	10

*222,119 square miles.

In addition to the foregoing, the population apportioned apart numbered 27,295 in Algiers, 17,349 in Constantine, 18,894 in Oran, and 7721 in the Southern Territories; making a total for all Algeria of 5,563,828 inhabitants. The principal towns are: Algiers, with (1911) 172,397 inhabitants; Oran, 123,086; Constantine, 65,173; Bone, 42,039; Tlemcen, 39,874; Blidah, 35,461; Tizi-Ouzou, 31,404; Sidi-bel-Abbès, 30,942; Philippeville, 27,370.

The births for the year 1910 numbered 153,157, still births 2338, deaths 108,950, marriages 40,776. For the year 1912: 161,851 living births (22,557 of which European), 2352 still births, 41,917 marriages, 10,730 divorces, 92,752 deaths.

PRODUCTION. The country is largely agricultural. In the table below are given, by departments and with totals for Algeria proper, areas in thousands of hectares and yield in thousands of metric quintals (wine in thousands of hectolitres) of main crops for the year 1912:

Crops	Al.	Con.	O.	Total
Vines, ha.	68.6	84.4	13.1	166.1
Vines, hs.	4,217.0	1,833.0	571.0	6,621.0
Cereals, ha.	686.0	917.2	1,443.0	3,046.2
Cereals, qs.	4,161.0	5,576.0	6,716.0	16,453.0
Other,* ha.	44.0	22.0	49.0	115.0
Other, qs.	486.0	395.0	434.0	1,315.0
Meadows,† ha. ..	13.6	7.7	7.2	28.5

Crops	Al.	Con.	O.	Total
Meadows, qs.	490.0	186.0	208.0	884.0
Olives, no.	2,093.0	734.0	3,487.0	6,314.0
Olives, qs.	401.0	95.0	2,758.0	3,254.0

* Other foodstuffs, including roots and legumes.

† Sown grasses.

The area under vines in 1910 was 152,100 hectares, yielding 8,414,000 hectolitres of wine; cereals, 3,001,000 hectares, yielding 22,147,000 metric quintals; roots, legumes, etc., 89,300 hectares, 1,319,000 quintals; forage plants and sown grass, 26,000 hectares, 822,000 quintals. Natural grasses covered 851,000 hectares, the harvest being estimated at 3,871,000 quintals. Olive trees number 6,855,000, yielding 3,364,000 quintals of olives and 351,000 hectolitres of oil. In the table below will be found the areas devoted to principal cereal crops for two years, with the total yield and the average yield per hectare (preliminary figures) for 1914-15:

	Hectares		Quintals	Qs.
	1913-14	1914-15	1914-15	ha.
Wheat	1,368,034	1,298,633	9,481,472	7.3
Barley	1,267,932	1,094,005	8,679,835	7.9
Oats	231,714	238,770	2,189,172	9.2

Fruits, olive oil, timber, cork, and live stock are also produced for export. Silk culture is practiced. The mines yield iron, zinc, lead, silver, copper, mercury, coal, and petroleum. The phosphate industry is progressing. The fisheries products are of appreciable value. Live stock (1911): 226,764 horses, 192,484 mules, 279,315 donkeys, 1,113,952 cattle, 8,528,610 sheep, 3,861,847 goats, 110,012 swine.

COMMERCE AND COMMUNICATIONS. The table below shows the imports for consumption and exports of domestic produce in thousands of francs:

	1908	1909	1910	1912	1913
Imports ..	449,300	462,000	512,000	669,638	729,112
Exports ..	319,200	359,200	513,300	546,099	562,917

In the table below is given the 1912 trade by great classes, values in francs:

	Imports	Exports
Animals, etc.	37,888,000	64,804,000
Vegetable products	114,904,000	409,416,000
Minerals, etc.	45,452	47,058
Manufactures	471,394	24,821
Total	669,638,000	546,099,000

Vessels entered (1912 trade), 5375, of 6,589,265 tons. Railway in operation Dec. 31, 1912, 3285 kilometers of main and 150 kilometers of local lines; telegraph lines, 15,199 kilometers, wires, 39,652.

FINANCE, ETC. The budget for 1914 estimated the revenue at 171,364,550 francs and the expenditure at 171,325,658: for the Southern Territories revenue and expenditure were calculated at 5,531,025 and 5,508,458 francs, respectively. The debt stood Jan. 1, 1913, at 71,853,205 francs. A governor-general administers the country.

ALIEN LABOR LAWS. See under LABOR.

ALLEN, CHARLES JULIUS. American soldier, died June 15, 1915. He was born in Buffalo, N. Y., in 1840, and graduated from the United States Military Academy in 1864. In the same year he was appointed first lieutenant in the engineers. He was brevetted captain in August,

1864, for highly meritorious service in the forts at Mobile, Ala., and received the brevet of major for gallant services in the following year. During the war he served in the division of West Mississippi and the Department of Louisiana. He rose to be lieutenant-colonel in 1897, and brigadier-general in 1904, retiring, by his own wish, in the last named year. His chief work was in the construction of fortifications and in the improvement of rivers and harbors. During the Spanish-American War he was in charge of the defenses in Washington.

ALLEN, WILLIAM FREDERICK. An American editor and engineer, died Nov. 9, 1915. He was born in Bordentown, N. J., in 1836. Civil engineering he learned from practice in the field, and from private study. His early engineering work was followed by a long career as manager of the National Railway Publication Company, beginning in 1873. To him was referred in 1881 the problem of working out a standard time reckoning that would obviate the confusion due to the use of the more than fifty time standards then prevailing in the United States. His plan, which was adopted, is the one now used throughout the North American continent. He was for several years a delegate to the meetings of the International Railway Congress, and in 1905 was associate secretary-general of this body. He received an honorary degree from Princeton University, and from the Belgian government he received a decoration. He contributed to various magazines and encyclopædias on subjects relating to railways and standard time.

ALLOYS. See **CHEMISTRY, INDUSTRIAL**, section so entitled; and **METALLURGY**.

ALSACE-LORRAINE. See **WAR OF THE NATIONS**.

ALTERNATING CURRENTS. See **DYNAMO-ELECTRIC MACHINERY**; **ELECTRIC POWER, TRANSMISSION OF**; and **ELECTRIC RAILWAYS**.

ALUMINUM AND BAUXITE. The production of bauxite and the consumption of aluminum in the United States, in 1914, was the largest ever recorded. There was an output of 219,318 long tons of bauxite, valued at \$1,069,104, compared with 202,241 long tons, valued at \$997,598 in 1913. The States which produced bauxite in 1914 were: Alabama, Arkansas, Georgia, and Tennessee. Arkansas produced about 80 per cent of the output. The production in Georgia, which held second place for two years, and in Alabama and Tennessee was considerably less in 1914 than in 1913. The imports of bauxite amounted to 22,484 tons, valued at \$96,500. Bauxite is used in the production of metallic aluminum, and the manufacture of aluminum salts, bauxite bricks, and alundon. Its use in the production of metal aluminum is by far the most important one. The quantity of aluminum consumed in the United States in 1914 was 79,129,000 pounds, compared with 72,379,000 pounds in 1913. The growth of the industry is shown by the fact that the production in 1844 was 150 pounds, in 1894, 550 pounds, and in 1904, 8,600,000 pounds. The value of the exports of aluminum and of the manufactures of aluminum amounted to \$1,546,510 in 1914, compared with \$996,964 in 1913. Aluminum is the most abundant of materials, and ranks third among the elements on the crust of the earth, being exceeded only by oxygen and silicon. See also **CHEMISTRY, INDUSTRIAL**.

ALVERSTONE, SIR RICHARD EVERARD WEBSTER, first baron. An English jurist, died Dec. 15, 1915. He was born in 1842, and was educated at Charter House School, and Trinity College, Cambridge. At Cambridge he was an honor man, and received the honorary degrees of LL.D. and D.C.L. In 1868 he became a barrister, and ten years later queen's counsel. He stood successfully for Parliament in 1885; was knighted in the same year; and was appointed attorney-general, an office which he held three times under Lord Salisbury. In 1899 he was made a baronet. Lord Alverstone was chiefly known in the United States as the English representative in the Alaska Boundary Commission. His vote in upholding the principal claims of the United States government before the commission resulted in the United States receiving a favorable decision. As a result of his action in this matter, he was severely criticised in Canada, the Canadians contending that the United States government went into the conference with foreknowledge that the United States claims were to be upheld and that Lord Alverstone had been made a commissioner largely to carry through the pre-arranged programme. This contention was never proved. Lord Alverstone also served as one of the English counsel to the Boundary Arbitration Commission, which met in Paris in response to the message of Cleveland on the Venezuela boundary dispute. In 1893 he was chairman of the British Commission at the World's Fair. He was made Lord Chief Justice of England in 1900, and at the same time was elevated to the peerage.

AMAZON, THE. See **EXPLORATION, South America**.

AMERICAN ASSOCIATIONS AND SOCIETIES. For any organization whose official title begins with the word American, see under the specifically descriptive word in that title.

AMERICAN COMMISSION FOR RELIEF IN BELGIUM. See **RELIEF FOR WAR VICTIMS**.

AMHERST COLLEGE. An institution for higher learning, founded in 1821 at Amherst, Mass. The enrollment in the several departments in the autumn of 1915 was 425. The faculty numbered 44. Prof. Walton Hale Hamilton, formerly of the University of Chicago, was appointed professor of economics, and Stark Young, formerly of the University of Texas, was appointed professor of English literature. The gifts received during the year amounted to about \$25,000. The productive funds at the end of the year 1915 amounted to \$2,796,000, and the income to \$176,364. The library contains 110,000 volumes. President, Alexander Meiklejohn.

ANÆSTHESIA. Bevan made a study of the methods of anæsthesia now in vogue and attempted to analyze them from the standpoints of safety, comfort, efficiency, control, simplicity, and the after effects and complications. The agents or methods studied are chloroform, ether, nitrous oxide gas, scopolamine and morphine, spinal anæsthesia, nerve blocking, infiltration, intravenous anæsthesia, both general and local, intrarectal, intratracheal, intrapharyngeal, Crile's anoci-association, together with mixtures and sequences. Most of his conclusions are those generally accepted at the present time. Ether given by the drop method is considered the most safe and simple form of inducing unconsciousness. The mortality is given as one in

5000 to 10,000 cases. There is a growing distrust of scopolamine and morphine (see TWILIGHT SLEEP). It is unreliable and unsafe. After the dose is once injected it is beyond the control of the surgeon. Delirium, sometimes of a serious character, is produced. As a preliminary to general anæsthesia the evidence is that scopolamine and morphine, even in small dosage, add to the anæsthetic risk and to the after complications. Bevan's study demonstrates it to be more dangerous than chloroform, and he estimates the risk as one death to 500 cases. It is uncomfortable and inefficient in a considerable number of cases. Nerve blocking, i.e. the infiltration with an anæsthetic such as cocaine or novocaine of the nerve supply to the part to be operated upon, requires a high degree of skill, occasions the patient considerable suffering, is not always efficient, and has often to be supplemented by general anæsthesia. In the hands of a specially skilled operator the method has, however, many advantages. Bevan's paper is notable for its open condemnation of rectal anæsthesia and Crile's anoci-association. Against rectal anæsthesia the same objections are urged as against the previously cited methods, namely, lack of safety, lack of control, discomfort to the patient, inefficiency, the possible complications of distention of the bowels, severe local irritation of the colon, with sometimes bloody diarrhoea, which may be fatal. Crile's assertion that in anoci-association the brain is completely severed from the field of operation by blocking the nerve with novocaine finds no acceptance; and the complicated sequence of scopolamine and morphine, nitrous oxide, oxygen, ether, novocaine and quinine, and urea hydrochlorid is also open to many objections. Rectal anæsthesia and anoci-association are described in the 1914 YEAR BOOK.

SACRAL ANÆSTHESIA. This is a term applied to the injection of a local anæsthetic into the sacral canal, called by Cathelin "epidural," and Lâwen "extradural" anæsthesia. The procedure consists of injecting through the dorsal hiatus 20 c.c. of a 2 per cent solution of novocaine, to which a small amount of epinephrin has been added. Bull has used this technic in 64 cases, the result being ideal in 47 of them, and failure in the rest. Of the complications incident to the method there were slight bleeding from the sacral canal in two cases, six cases had transient pallor, vertigo, and rapid pulse. These symptoms, however, were evanescent. The parts anæsthetized are those which lie below the level of the exit of the sacral nerve.

Blocking the pudic nerves by injecting them with novocaine in order to secure painless childbirth will be described under TWILIGHT SLEEP (q.v.).

Smith and Porter explain the dangers of spinal anæsthesia on the ground of exsanguination of the important nerve centres of respiration and circulation. A drug may affect the respiratory centre directly, or indirectly, by lowering the blood pressure to a point where this fluid is insufficient to supply the nutritive needs and the amount of oxygen necessary to carry on life. An alarming fall of the blood pressure is the first serious symptom noted in fatal cases of spinal anæsthesia, and Smith and Porter remark that the dilatation of the arteries controlled by the splanchnic vasomotor fibres may permit the corresponding veins to become dis-

tended so that not enough blood is left in the bulb and cord to supply these needs. They say, for instance, that a rabbit "may be bled to death into its own portal system, by section of the splanchnic nerves." When death does not ensue, permanent injury to important vital centres may be caused.

ANDERSON, GEORGE SMITH. American soldier, died March 8, 1915. He was born in Bernardaville, N. J., in 1849, and graduated from the United States Military Academy in 1861. In the same year he was appointed second lieutenant to the sixth cavalry, and served in frontier duty at Fort Hays, Kan. After taking part in many campaigns against hostile Indians, he was appointed assistant to the professor of natural and experimental philosophy at West Point, in 1877. In 1881 he was sent back to Arizona, and after remaining there a year was transferred to Colorado. In 1885 he was appointed captain of the sixth cavalry. In 1899 he was major in the second cavalry, but was transferred back to the sixth. In the same year he went to the Philippines as colonel of the United States volunteer infantry, and he with this regiment took a prominent part in quelling the Philippine insurrection. Appointed colonel of the eighth cavalry in 1903, he later became colonel of the ninth cavalry. In 1911 he was made brigadier-general, and was given command of the Department of Visaya in the Philippines. The following year he was retired.

ANGLICAN CHURCH. See ENGLAND, CHURCH OF.

ANGLO-FRENCH LOAN. See FINANCIAL REVIEW, section so entitled.

ANGOLA. A West African Portuguese colony, with an estimated area of about 490,000 square miles, and a population estimated at 4,200,000. St. Paul de Loanda is the capital. Tropical agricultural products are exported. The rubber supply is failing. The trade is mainly with Portugal. In 1909 the imports were valued at 5,674,861, and the exports at 5,485,085 milreis; transit, 326,349 milreis. In 1910 the imports were valued at 6,022,294 milreis, and the exports at 3,311,863; transit, 326,349. The trade for 1912 is unofficially reported, exclusive of Congo, at £1,068,200 imports, and £1,394,200 exports. Revenue (estimate) in 1909-10, 2,321,373 milreis; expenditure, 3,171,373; 1913-14, the budget balanced at 5,092,677 milreis. Work on the railway line from Lobito Bay, in the southwest frontier of the Belgian Congo, which is to connect with the Central African system, is progressing. Total length of lines open for traffic in 1913, 323 miles. The colony is administered by a governor-general.

ANNAM. A French protectorate on the China Sea; a part of the dependency of French Indo-China (q.v.). Hué is the capital, with 65,000 inhabitants, and Bin-Dinh the largest town (75,000). The trade is included with that of French Indo-China. Raw silk, cattle, and agricultural and forest products are exported. There are valuable mineral deposits, but mining is not well developed. The native king (Duy-Tan) is the nominal head of the government. He succeeded, in 1907, at the age of eight, and was placed under a council of regency. Internal affairs are actually administered by the French resident.

ANNIVERSARIES. See EXPOSITIONS.

ANOPHELES. See MALARIA.

ANTARCTIC EXPLORATION. See POLAR RESEARCH.

ANTHRAX. See VETERINARY MEDICINE.

ANTHROPOLOGY. While the European war has interfered with the commencement of novel researches on the previous scale and prevented the continuation of old ones, anthropology is still reaping a considerable harvest of publications based on investigations dating farther back. In America, indeed, anthropological activity seems unabated either in point of publication or research.

ANTIQUITY OF MAN AND PHYSICAL ANTHROPOLOGY. While no epoch-making discovery can be registered for this year, there has been a pronounced tendency to synthesize the entire problem of man's origin and development. Arthur Keith's *The Antiquity of Man* is primarily an anatomical treatise; the second edition of W. J. Sollas's *Ancient Hunters and Their Modern Representatives* is a more popular attempt, brought up to date, to sketch human evolution and to reconstruct ancient European culture by comparison with modern primitive peoples; somewhat similar in scope is G. Scott Elliot's *Prehistoric Man and His Story*; H. F. Osborn's *Men of the Old Stone Age* is distinguished by the welding together of anthropological, geological, and palæontological evidence for the purpose of presenting a definite chronology of human development.

A startlingly new interpretation of "The Jaw of the Piltown Man" has been given by Gerrit S. Miller (*Smithsonian Miscellaneous Collections*, vol. lxx, no. 12). According to him, the remains concerned include parts of a brain-case clearly human, but a mandible, two lower molars, and an upper canine showing features hitherto unknown except among members of the genus *Pan* (chimpanzee). Since the two groups of finds possess the exact characters of genera belonging to distinct families, the best assumption is not that they belonged to a single unknown genus, but to two distinct individuals, the skull belonging to a man, the jaw to a chimpanzee. While it has been supposed that chimpanzees were lacking in the Pleistocene European faunas, some corroboration for Miller's theory is found in the fact that a tooth not clearly distinguishable from the first lower molar of a chimpanzee has been discovered in the German Pleistocene.

In a discussion of the Baining of New Britain, L. Bauer (*Archiv für Anthropologie*, p. 145 et seq.) arrives at the conclusion that a host of primitive features are united in their short, high crania, which suggest Mongoloid and Australian affinities. The very small cranial capacity is explained by retrogression since all the surrounding types from which the Baining might have developed have a distinctly larger capacity. Political events have stimulated somatological researches among European populations. Thus Drontschilow (*ibid.*, pp. 1-76) publishes the results of an important investigation of the Bulgarians. He finds that besides the undoubted Slavic factor there is also a numerically very important Finnish element, dark-haired and long-headed, which is racially allied to the primitive Russian population. He further shows (*ibid.*, p. 337 et seq.) that the stature of the Bulgarians increases as one proceeds southward. The same nation is studied by Loritz (*Korrespondenzblatt*, p. 21 et seq.), who distinguishes

the North Bulgarian from the South Bulgarian long-heads. While the former must be traced to a northern zone of origin, the dolichocephalic southerners are due to South Macedonian relations and are probably connected with the people of Crete. "The Bronze Age Invaders of Britain" (*Journal Royal Anthropological Institute*, 1915, pp. 1-22) are discussed by A. Keith, who finds their cradle in the plains along the northern flanks of the central mountainous region of Europe. The racial affinities of the Jews are discussed by Schiff and Weissenberg (*Arch. f. Anthropol.*, pp. 348 et seq., 383 et seq.). Schiff corroborates the view of Von Luschan, that the Jews represent two distinct types, one allied to the peoples of Asia Minor, the other peculiarly Semitic, i.e. akin to the Bedouin Arabs. Weissenberg confirms Von Luschan's conclusion with respect to the fusion of these two distinct races, but differs as to the time and place of the process. Instead of being prehistoric and occurring in Palestine, the mixing took place in historic times and in Armenia.

GENERAL ETHNOLOGY

In general ethnology the extensive use of diffusion to account for similarities hitherto preferably explained by the psychic unity of mankind persists with unabated force. Thus in *The Migrations of Early Culture*, G. Elliot Smith infers from the examination of a mummy from Torres Straits that the natives must have borrowed the technique of mummification prevalent among the Egyptians of a definite period. He further suggests that at about 800 B.C. the processes of preserving corpses spread widely from northern Africa in association with many other cultural traits, such as megaliths, head-deformation, ear-piercing, the svastika, and a cult of sun and serpent. The transmission of such a cultural complex to remote areas is in thorough harmony with the views defended during the last decade by F. Graebner in Germany and more recently by W. H. R. Rivers in England. Rivers, indeed, comments sympathetically on Elliot Smith's theory, suggesting merely that instead of a single process of diffusion there may have been a number of successive waves of migration (*The Journal of Egyptian Archaeology*, 1915, p. 256 f.). An elaborate scheme of hypothetical layers of culture in Oceania has been developed by Rivers himself (see below), while Ankermann operates with corresponding conceptions in dealing with the problem of totemism (see AFRICA).

The relation of ethnology to other sciences has also occupied the attention of students. In his "Eighteen Professions" (*American Anthropologist*, 1915, p. 283 et seq.) Kroeber takes an uncompromising attitude against any attempt to connect ethnology, which he defines as a purely historical science, with either psychology or biology. A less decided position is maintained by Lowie in an essay on "Psychology and Sociology" (*American Journal of Sociology*, 1915, 217 et seq.); while he recognizes much of so-called psychological explanation of ethnologic phenomena as worthless, he believes that scientific psychology may lend greater vigor in the formulation of ethnological facts and act as a corrective in speculative interpretation, besides suggesting new vistas of inquiry.

The problems of social organization are in large measure dealt with in Rivers's *The His-*

tory of *Melanesian Society* (see OCEANIA). Lowie has pointed out that in North America "Exogamy and the Classificatory Systems of Relationship" (*American Anthropologist*, 1915, p. 223 et seq.) are co-extensive and genuinely correlated, as demanded by Rivers's theory. In his *Literary Aspects of North American Mythology* Radin calls attention to the oft-neglected fact that the tales collected from primitive tribes must be studied not merely from the point of view of their religious or philosophical interest or that of the distribution of certain plots and anecdotes, but also as literary products.

NORTH AMERICA. The tendency to reduce the number of linguistic stocks persists in spite of much skepticism on the part of some scholars as to the genetic affinities of certain families recently united by other linguists. Most noteworthy among the recent syntheses is Sapir's "The Nadene Languages" (*American Anthropologist*, 1915, 534 et seq.), in which an attempt is made to prove the kinship of Haida, Tlingit, and Athapascan. The same student has also presented further evidence for the existence of a Uto-Aztecan stock (*ibid.*, p. 306 et seq.).

Of general culture-historical significance is Porcild's attempt to establish the indigenous invention of "The Principle of the Screw in the Technique of the Eskimo" (*American Anthropologist*, 1915, p. 1 et seq.), which has been ably discussed by Lauf (*ibid.*, pp. 396-406).

Interesting data on *Family Hunting Territories and Social Life of Various Algonkian Bands of the Ottawa Valley* have been published by Dr. F. G. Speck, to whom we are likewise indebted for a collection of *Myths and Folk-Lore of the Timiskamig Algonquin and Timagami Ojibwa*. The theoretically most suggestive point in these studies is the social importance of the family hunting territory, in which all the male members share the right of hunting and fishing. There are two bonds of union in these Algonkian societies,—the family group corresponding to the hunting territory, and the gens, which is exogamous and totemic, though without any belief in descent from the totem or any taboo relating to the animal from which the group takes its name. The two types of unit are more or less permanently associated with each other, yet the hunting territory groups have distinct names and are of greater practical significance. Hunting outside of one's own territory was punishable with death. The history of the development of these divisions seems to be that their founders represented members of a few gentes of the Great Lakes Ojibwa, who had migrated northward in search of better game. After the death of the founder his tract of land was divided among his sons, each of whom founded a new family, which received a distinctive name. In the Timagami band there were three officers with definite political functions. The head chief was assisted by a deputy who officiated during his absence and acted as his speaker. Chiefs were elected for life tenure and were generally succeeded by their deputies. The third officer's duty was to collect provisions for feasts and to distribute meat among the families of the camp.

Two substantial additions to our knowledge of Central Algonkian mythology are offered in Skinner and Satterlee's *Folklore of the Menomini Indians*, and W. Jones and T. Michelson's *Kickapoo Tales*. Radin has supplied us with an

account of *The Social Organization of the Winnebago Indians*, who, while Siouan in language, belong with the Eastern Woodland tribes culturally. An interesting phase of Central Algonkian culture finds treatment in A. Skinner's *Associations and Ceremonies of the Menomini Indians*. Most of these societies are equally typical of other Woodland tribes, but there are also traces of recent Plains Indian influence. In one spectacular ceremony the performer plunges his naked arms into boiling water and takes them out unscathed. There is an important order of seers or shamans who enter into direct communication with the spirit world through the medium of the turtle and are thus enabled to recover lost property for their clients or to dispense appropriate treatment to those smitten with disease. In the latter case the cause of the suffering is extracted in the form of a worm or some small object and is either destroyed or sent against the evil sorcerer who planted it in the patient's body. Except for the Medicine Dance, the associations of the Menomini are not firmly knit and definitely organized units like the societies of the Plains, but consist simply of men who share the same supernatural experiences.

Wissler's *Riding Gear of the North American Indians* is at the same time a contribution to the recent ethnology of the Plains region and to the wider subject of cultural diffusion. The Indians seem to have adopted, without essential change, the South European and Asiatic type of saddle in vogue at the period of colonization. The main part of the riding-gear was borrowed by the tribes in direct contact with the Spaniards and thence spread as far as the Plains of Canada without important alteration. While the Indian generally mounts on the right side, this variation is merely a return to the normal method, which was deviated from in Europe simply because the sword was worn on the left side. Most interesting is the thoroughness with which the horse culture was assimilated by the American aborigines. If a non-historical people had brought it to America, the similarities between the forms in the Old and the New World would be a source of perplexity and the tendency would be to view them as independently evolved. This indicates that the theory of independent invention may become a skeptical form of dogmatism. Similar issues are discussed in the same author's *Costumes of the Plains Indians*. The typical style of the area based on the use of two skins seems to have been suggested by the natural contour of the materials used. The notion of tailoring dress so as to have it follow the lines of the body is absent in America except among the coat-wearing Eskimo and northern Indian tribes. In the Old World the practice of tailoring appears among the primitive peoples of northern Asia, but the idea of treating cloth in this way seems to have developed only in central Asia. The extensive use of rectangular ponchos seems to be due to the limitations imposed by the technology of weaving. Whether the northern tribes developed tailoring from the exigencies of climate or borrowed the processes from a more highly civilized central Asiatic people, remains a moot-problem. As regards the other aspects of the question of diffusion as against independent development, the distribution of both the two-skin garment and such minor features as the cut of skirt-bottoms over continuous regions strongly suggests diffusion.

Lowie's paper on *Societies of the Arikara Indians* establishes the former existence of hitherto unrecorded women's organizations in this tribe, one of them clearly associated with the planting of corn and both historically connected with corresponding bodies of women among the Mandan and Hidatsa. The men's organizations display some striking resemblances to those of the Pawnee, of whom the Arikara are an offshoot, but on the whole the unity of the society systems of these two tribes has become obscured, doubtless owing partly to recent contact with the Mandan and Hidatsa. Nevertheless, the Arikara did not adopt the method of grading their societies as current among these neighbors. *Dances and Societies of the Plains Shoshones* by Lowie contains a description of the ceremonial life of the Comanche, Ute, and Wind River Shoshone. This aspect of culture is very slightly developed among all the tribes concerned, only the Wind River people showing clear affinities with the police organizations found to the east and north. The most important of all the ceremonies in question, the Ute Bear Dance, is of a quite different character, symbolizing the awakening of bears after their long hibernation. In *The Sun Dance of the Crow Indians* the same author gives a detailed account of a performance briefly sketched in a last year's publication and reported in the YEAR BOOK for 1914.

A number of unsuspected features of Southern Siouan life are revealed in A. Skinner's *Societies of the Iowa, Kansa, and Ponca Indians*, the traits in question appearing in full force among the first-named people. The Iowa are not only organized in exogamous gentes but also in three more or less endogamous castes of chiefs, noblemen, and the common people, this institution suggesting possible influence from the Natchez. Moreover it appears that the military organizations are much more highly developed among these southern tribes than had been supposed. The societies are ungraded like those of the Crow Indians and share with Crow organizations a highly developed sense of rivalry both as to war exploits and in the stealing of one another's wives. In recent times all other social and ceremonial usages of the Iowa have been eclipsed by the peyote cult, involving the ritualistic eating of the narcotic peyote plant, and strangely combining Christian with ancient pagan elements of belief.

In the Southwest of the United States considerable activity may be recorded. N. C. Nelson has published his researches among the *Pueblo Ruins of the Galisteo Basin*, New Mexico. The Galisteo Basin formed the last permanent home of the Tano tribe, a Pueblo people related to the Tewa. A considerable number of ruins had been reported from this region, not all of which, however, could have been occupied simultaneously unless a quite incredibly large Tano population be postulated. It is more reasonable to assume that, though essentially sedentary, the Tano shifted occasionally from stress of circumstances. The remains of the seven settlements excavated by Nelson belong to the same type of culture, all the pueblos being large and arranged on the same plan. There is further practical identity with the culture of the Jemez Plateau. The presence of charred maize with numerous metates and mullers indicates an agricultural population, especially since there is a paucity of indigenous animal bones, indicating

the subordinate place of hunting in the economic scheme. The circular and partly subterranean kiva occurred in all but one or two sites, but its scarcity presents a contrast to the region west and northwest of the Rio Grande. Artificial reservoirs form a noteworthy feature in all the pueblos. While some of the ruins fall within the historic period, their architecture presents no marked alterations due to Spanish influence as compared with the prehistoric ruins. On the other hand, the introduction of domesticated animals from Europe is indicated by osseous remains of goats, cows, hogs, and horses.

The prehistoric art of part of this area has been exhaustively treated by A. V. Kidder in his "Pottery of the Pajarito Plateau and of Some Adjacent Regions in New Mexico" (*Memoirs of the American Anthropological Association*, vol. ii, part 6). Kidder divides the ruins of this territory into two groups, small scattered dwellings and large pueblos, and discovers a fundamental difference between their ceramic products. In the former there is a black-and-white ware such as is distributed over practically the entire Southwest and which appears to be the oldest of the types found; its decorative character is strictly geometric. The pottery of the great ruins is markedly different and may be provisionally defined as "Pajaritan" though related forms occur from the Chama and Taos in the north to the vicinity of El Paso in the south, and from Pecos and the Manzana Salt basin in the east to Acoma and the Rio Puerco in the west. Among the distinctive features of a large class of Pajaritan pottery vessels is the glaze, which was produced by mixing a flux with the black pigment so as to produce a vitrification of the lines of the ornament, while the remainder of the surface remained unglazed. The decorative motives include, in addition to numerous geometrical patterns, a number of realistic elements. In ruins of intermediate size there are again distinct ceramic types, one of which is, however, clearly related to the Pajaritan, while the other may be a more remotely connected predecessor and is almost certainly affiliated with the pottery of ancient Zuni and the Little Colorado ruins. Ethnographically the literature of the area has been enriched by a popular account of *The Hopi* by Walter Hough, one of the pioneer field-workers in this region.

For the Northwest Coast tribes we have E. Sapir's *Sketch of the Social Organization of the Nass River Indians*. Though closely related otherwise, these natives include four politically distinct groups. In social organization these Indians resemble the Tsimshian proper with whom they form a common linguistic stock. There are four exogamous units with maternal descent. Two of these bear animal names, the others have designations of unknown meaning. The exogamous groups are subdivided into families which are graded in rank and have distinctive crests, songs, and myths. Names are bestowed by the father, who necessarily belongs to a different exogamous division from his children, and accordingly they reflect the crest of the namers rather than of the individuals bearing them. The customary Northwestern division of the people into three castes of chiefs, common folk, and slaves also obtains in the Nass River country.

CENTRAL AND SOUTH AMERICA. *An Introduction to the Study of the Maya Hieroglyphs* by

S. G. Morley fills the long-felt want of a brief summary of this abstruse subject, which will be as useful to the general ethnologist as to the lay reader.

The moot-problem, whether the South American specimens composed of copper and tin indicate a native bronze technique, has been settled by Charles W. Mead's *Prehistoric Bronze in South America*. It had been assumed by some writers that the copper mined by the aborigines contained among its other impurities a certain admixture of tin while others favored the view that the two metals were obtained separately and smelted together in order to secure a harder material. Mead gathers together relevant historical data given by the old Spanish writers and presents the results of recent chemical analyses, specially conducted for the purposes of his investigations. It appears clearly that the bronze objects, especially those of Bolivian provenience, under discussion, contain a large percentage of tin, while the copper ones of the region contain none. The ruins of Machu Picchu yielded a piece of pure tin, from which presumably slices were cut by the artisan to make bronze. Finally, smelting furnaces, slag with tin, and molds for casting have been found in Argentina, where all known coppers lack tin in their impurities; thus supporting the positive statement of early Spanish sources that the Bolivians consciously mixed tin and copper. All this evidence renders it practically certain that a genuine bronze technique existed in Bolivia, the high plateau region of Peru, and Argentina.

A new line of investigation has been undertaken by M. D. C. Crawford in his *Peruvian Textiles*. Crawford examines the fabrics of ancient coastal Peru from the point of view of a modern technical expert, discussing in detail the processes of spinning, weaving, and design technique. It is clear from this attempt that in the treatment of such topics the ethnologist will henceforth have to rely largely on the coöperation of the textile specialist, lest significant features shall escape his notice.

ASIA. An aching void in ethnological literature has been filled by Miss M. A. Czaplicka's *Aboriginal Siberia*, which for the first time renders accessible a host of data hitherto buried in Russian and Polish publications and also summarizes all other information available on the social organization and religion of the natives. On the basis of this material she proposes a tentative historico-geographical classification of tribes into Palæo-Siberians and Neo-Siberians. The former, embracing the Chukchee, Koryak, Kamchadal, Ainu, Gilyak, Siberian Eskimo, Aleut, Yukaghir, Chuvanzy, and Yenisei Ostyak, represent the autochthonous population which formerly occupied a much wider territory, but was forced to retreat northward and eastward by the encroachments of the Neo-Siberians. These relative newcomers are grouped in five stocks: the Finnic, including the Ugrian Ostyak and Vogul; the Samoyedic; the Turkic, embracing in Siberia the Yakut along the Lena and southward to the Amur; the Mongolic, confined in Siberia almost wholly to the Buryat of Lake Baikal; and the Tungusic, which includes, besides the Tungus proper, the Goldi of the Amur, the Siberian Manchu, and a number of other tribes. The Neo-Siberians have caused a number of important migrations and movements of population.

Thus, the Mongolic Buryat arrived in the Lake Baikal region about the thirteenth century A.D., displaced the Turkic Yakut and caused the latter to move northward to and along the Lena River. Thus the Yakut cut into the territory of the Tungus, part of whom went west and northwest, while the rest migrated to the Stanovoi Mountains, the Okhotsk and Amur country in the extreme east.

The first comprehensive study of Philippine folklore is presented in Fay-Cooper Cole's *Traditions of the Tinguian*, a pagan tribe of north-western Luzon. The mode of thought that appears in this body of aboriginal literature corresponds closely with that still current among the people. The tales are of three types,—those dealing with the mythological period; the ritualistic and explanatory tales, of which the mediums possessed by spirits during ceremonies are the depositaries; and folk-tales representing the native store of fictitious narratives without serious meaning. The last group shows much similarity with alien tales, some stories being borrowed from the Christianized Ilocano, while others even suggest in a startling manner incidents in American Indian plots, though not to a sufficient degree to indicate historical connection in the present stage of our knowledge. The mythical stories seem to enable the reconstruction of a remote period of the Tinguian past, in which the people did not yet have terraced rice-fields, were ignorant of the domestic work animals, and had not yet made the acquaintance of the horse.

OCEANIA. Dr. W. H. R. Rivers has contributed a work of fundamental significance in *The History of Melanesian Society* (2 vols.). It records new field data, particularly on the secret organizations of the Banks Islands and the culture of the hitherto all but unknown Island of Tikopia, which is proved to be closely related to that of Tonga. More important than the additions of fact, however, is the analysis of Oceanian culture into a number of component strata superposed upon one another by successive migrations. The author here applies the principle that far-reaching effects may be produced by small bodies of immigrants and discusses the mechanism by which new conceptions are introduced, pointing out how contact of different cultures results in features formerly lacking in both. Polynesian culture is regarded as a compound of two elements, while Melanesian culture is considered the joint product of two successive migrations among an earlier people possessing an organization of society into exogamous matrilineal moieties. The later Polynesian stratum is affiliated with the earlier Melanesian immigration, while the earlier Polynesian stratum entered into the structure of the old dual people, whose culture in turn is explained by the fusion of two distinct peoples.

AFRICA. In his "Recherches Préhistoriques" (*L'Anthropologie*, 1915, p. 193 et seq.) Pallary establishes a number of important conclusions as to the archæology of Morocco. He finds that this region was already occupied as far as the foot of the Atlas Range in the most ancient paleolithic periods. The abundance of stone implements by itself indicates a very long habitation. Neolithic stations are rare, and in the south neither ground axes nor arrow points were discovered. A considerable number of Berber ruins and tumuli show that the population of

ancient times rather exceeded that of the recent era.

A highly significant inquiry as to the distribution and character of African totemism is given in Ankermann's "Verbreitung und Formen des Totemismus in Afrika" (*Zeitschrift für Ethnologie*, 1915, pp. 114-180), which is practically the first summary of known data as to African social organization. Ankermann finds that the conditions in the Dark Continent corroborate Frazer's view as to the independence of totemism and exogamy. In Africa totemism is almost uniformly associated with paternal descent; systems in which the rule of totemic inheritance is mixed indicate confusion of a patrilineal totemic organization with a matrilineal non-totemic system. Whether the Bushmen and Pygmies were totemic, remains undecided. Apart from them probably all of Africa south of the Sahara formed a continuous totemic area prior to the advent of Christianity and Mohammedism, which have reduced this feature to a mere vestige, as among the Islamized Mandingo. The highly developed animal cult of ancient Egypt suggests that region as the possible point of origin of totemism. However, the essential belief of a blood-relationship with the sacred animal was certainly lacking in historic times and the hypothesis of an Egyptian starting-point would involve the auxiliary assumption that totemism existed in a far more remote epoch and that all the transitional forms leading to the later animal cult disappeared. As a member of Graebner's school, Ankermann attempts to assign to African totemism a place in some one definite cultural layer. The simplest supposition would be to assign it to the stratum of the primitive negro from whom both Sudanese and Bantu developed by differentiation, i.e. the second African stratum immediately succeeding that of the autochthonous Pygmies. The feature is characterized in this scheme by a union of totemism with exogamy and patrilineal descent. Unfortunately a difficulty arises because the totemic group is in a number of instances a unit of higher order than the exogamous clan. We are thus obliged to assume a totemic layer superimposed on the culture of an exogamous patrilineal non-totemic people. Since the peoples in question are clearly composed of a substratum of negroes lorded by a Hamitic caste, it seems plausible to regard the Hamites as the carriers of totemism, but here another obstacle develops from the fact that no purely Hamitic people is known to possess a totemistic organization. Ankermann is thus led to revert to the hypothetical totemism of prehistoric Egypt. Now early pictures of the Old Kingdom never represent negroes but only Semitic and Hamitic types, and Egyptologists only assume an infiltration of negro elements into Nubia towards the end of that period. If, therefore, the prehistoric Egyptians possessed a totemic system antecedent to their animal cult, it cannot have been derived from negroes but must have originated with one of the earlier ethnic factors of the Egyptian population. We should thus be driven to assume that the Hamites were in fact the transmitting agency in the spread of African totemism unless the alternative be adopted that it came from Madagascar, where it might have been carried originally by the Malays or may have constituted a pre-Malayan element. On the whole, however, Ankermann is disposed to disregard

this line of argument, partly on account of its largely hypothetical character, but also because of the many features shared by the totemic stratum of Africa with the so-called West-Papuan stratum of Oceania, to which a very high antiquity must be conceded. It seems hardly admissible to attribute this entire complex of cultural traits to the Hamites, hence totemism is probably after all an element of ancient negro stratum.

MEETINGS, EXPEDITIONS, PERSONALIA. The International Congress of Americanists met at Washington, D. C., December 27-31, in connection with the Second Pan-American Scientific Congress, the American Anthropological Association, and the American Folk-lore Society.

For obvious reasons practically no expeditions were undertaken by citizens of the belligerent European countries. We may record, however, the safe return to England of Miss M. A. Czaplicka from a successful trip to the Yenisei Ostyak and Tungus of Siberia. American operations have been but little affected by conditions abroad. The Bureau of American Ethnology supported Dr. J. R. Swanton's Muskogean field-work in Oklahoma and Dr. T. Michelson's linguistic researches among Algonkian tribes. Under the auspices of the New York Academy of Sciences and the partial collaboration of the American Museum of Natural History, Prof. F. Boas, assisted by Dr. H. K. Haeberlin, Dr. J. A. Mason and Mr. R. T. Aitken, has investigated the physical anthropology of Porto Rico, as well as laid the foundation for intensive archaeological research. The American Museum of Natural History equipped expeditions to the Zuffi (Prof. A. L. Kroeber); the Hopi (Dr. R. H. Lowie); continued archaeological activities at Trenton, N. J., and the vicinity of New York City (Messrs. L. Spier and A. Skinner); conducted excavations of New Mexican sites (Mr. N. C. Nelson); and continued work on Pawnee ceremonialism (Dr. C. Wissler and Mr. J. Murie). For the University of California Mr. W. E. Gifford studied the social organization of the Miwok, Yokuts, and Mono, while Dr. E. Sapir investigated the Yahi dialect of Yana from the lips of the last survivor of the tribe. The Geological Survey of Canada supported Mr. C. M. Barbeau's studies of the social life of the Tsimshian. Various explorations, mainly archaeological, were conducted on behalf of the George G. Heye Museum by Messrs. G. G. Heye and Pepper in Georgia, Mr. T. De Booy and Prof. M. H. Saville in the Antilles and South America, and Mr. M. R. Harrington in Cuba.

American anthropology lost its dean through the death of Prof. F. W. Putnam, formerly the head of the anthropological departments at Harvard and the University of California, and the organizer and stimulator of an infinite number of anthropological investigations and institutions. The growing recognition of the scientific status of anthropology is reflected in the award of a Royal Society's Medal to Dr. W. H. R. Rivers.

ANTI-BOYCOTT ASSOCIATION, AMERICAN. SEE EMPLOYERS' ASSOCIATIONS, section so entitled.

ANTIDOTES. See FULLER'S EARTH.

ANTIGUA. A presidency of the Leeward Islands colony, consisting of the islands of Antigua, Barbuda, and Redonda. (See LEeward ISLANDS.) The inhabitants are chiefly negroes. St. John, the capital (also the capital of the

Leeward Islands), had, in 1911, 7910 inhabitants. About 52,000 acres are under cultivation, the products including sugar, cotton, and pineapples. There are no rivers and few springs, and droughts are frequent. Revenue (1913-14), £52,218; expenditure, £51,017; imports, £167,577; exports, £138,219.

ANTI-MILITARISM. See *SOCIALISM, passim*; and *UNITED STATES, History*.

ANTISEPTICS. **HYPERTONIC SALINE SOLUTIONS.** During the European war now in progress, the antiseptic value of salt solutions, of more than ordinary strength, has received serious consideration. It has been noted that sailors suffering from injuries and often from shock incident to prolonged immersion in salt water, have recovered promptly from the most severe wounds; whereas soldiers receiving even slight wounds, often undergo a lengthy period of convalescence or die. The difference in environment may account for this. The soldier's wounds nearly always become dirty, owing to the peculiar conditions of trench warfare in soil where an intensive process of cultivation has been carried on and which swarms with anaerobic bacteria. Both the English and French surgeons report particularly favorable results in the military arm following the use of sea water or hypertonic saline solutions. A memoranda appearing in the London *Lancet* advised the application of a 5 per cent solution of common salt to which 0.5 per cent sodium citrate is added to prevent coagulation of serum. When citrate of soda is not available, a 5 per cent solution of salt is advised. Sea water may also be employed, this being equivalent to a 2.5 per cent salt solution. Dry and infiltrated wound surfaces call for solutions up to 10 per cent in strength. Deep, open wounds are best treated, after the removal of foreign bodies, by filling them with a hypertonic salt solution and plugging them lightly with gauze. Superficial wounds call for a simple application of gauze saturated in the solution. It is noted that a free flow of serous fluid takes place from the wounds, and the dressing must be changed frequently, and the skin covered with vaseline to protect it from irritation. Such wounds become rapidly healthy and clean and are then covered with a simple dressing. In France, Abadie reports good results from treating wounds with concentrated solutions of sea salt which, being hypertonic, promote exosmosis and diapedesis, there being a free flow of lymph and escape of the phagocytes into the wounds. Abadie irrigates the cavity with a 0.7 per cent solution of sea salt and then packs it with gauze moistened in a solution of from 14 to 28 per cent. He advocates it, not only for fresh wounds, but for old infected injuries. Morestin has had excellent results in old wounds and varicose ulcers. The salt rapidly modifies wounds which are atonic or covered with unhealthy granulations. See *SURGERY*.

The relative value of antiseptics for emergency wounds which cannot be treated immediately has also received careful study. The British government supplies each man in the army and navy with two packages, the first containing a paste composed of 20 per cent phenol in lanolin, to which may be added sufficient white wax to stiffen it; the second, a powder composed of equal parts of boric acid and salicylic acid. Keilty and Packer experimented with various

antiseptics to determine their relative inhibitory and germicidal power as well as their diffusibility. The organisms used were cultures of the staphylococcus aureus, streptococcus pyogenes and bacillus coli. The drugs tested were numerous and included the following classes: (1) Those drugs which are markedly active, examples of which are: tricresol, 10 to 20 per cent; thymol, 10 to 20 per cent; creosote, 25 per cent; mercuric iodide, 10 to 20 per cent; tincture of iodine, 5 to 10 per cent. (2) Those drugs which are slightly active: salicylic acid, 20 to 30 per cent; Japanese powder (salicylic and boric acid—so called because of its use in the Russo-Japanese War), 20 to 30 per cent; zinc chloride, 20 per cent; mercuric chloride, 0.2 to 0.4 per cent; guaiacol ointment, 10 per cent; mercuric ointment, 33 per cent; creosote, 10 per cent; carbolfuchsin (which contains 5 per cent of phenol). (3) Drugs which are inactive: iodine, 2 to 6 per cent; menthol and camphor, of each 20 per cent; boric acid, 30 per cent; iodoform, 90 per cent; zinc sulphate, 1 to 5 per cent; alcohol, 95 per cent; calcium chloride, 20 per cent; liquor formaldehyde, 0.1 and 0.5 per cent (in solution 1:1000, 1:500); lead nitrate, 5 to 10 per cent; silver nitrate, 5 per cent (in solution, 20 grains to 1 ounce); turpentine, 1 per cent; ether; chloroform; Delafield's hematocrylin; Sudan III; Loeffler's methylene blue; eosin, watery solution; iodine green; glycerin; bismuth betanaphthol, 20 per cent; salol, 20 per cent; hexamethylenamin, 20 per cent; zinc oxide, 25 per cent; scarlet red (2 per cent scharlach R); bismuth subnitrate, 50 per cent; balsam of Peru ointment, 25 per cent; scharlach R, saturated solution.

Summarizing their work, the authors concluded that, of the more important drugs, thymol and tricresol were very active, both alone and in combinations; and had the advantage of being very diffusible. Another notable finding was that scarlet red, much advocated as an antiseptic, had a very slight inhibitory action on the growth of bacteria. The authors recommend a paste or ointment composed of thymol and tricresol, of each 10 per cent, incorporated into a base composed of 70 parts of castor oil, 20 parts of white wax, and 10 parts of spermaceti.

ANTITOXIN. See *DIPHTHERIA*.

APPENDICITIS. Noteworthy contributions to the study of the causation of appendicitis have been recently made in the United States. The older view of causation by foreign materials, such as fecal concretions, seeds, etc., is now practically abandoned and interest centers in the bacteriology of the disease. The microorganism most frequently found in the appendix is the colon bacillus, sometimes in pure cultures, in other cases associated with streptococci or staphylococci. In the majority of cases the infection is mixed. Rosenow studied the fluids and tissues in and about the appendix and introduced isolated strains of microorganisms into the general circulation of animals. He further discovered that in the lumen of the appendix the colon bacillus predominated, while in its walls the chief bacteria were streptococci. The elective affinity of bacteria for certain tissues of the body is discussed in the article *BACTERIOLOGY* (q.v.). Rosenow's experiments indicate that appendicitis is commonly a blood-borne infection, secondary to some distant focus such as the tonsil. In comparison with the appendix, no part

of the gastro-intestinal tract is so rich in lymphoid tissues except the tonsillar region in each of these anatomic localities, especially in the young in whom lymphoid tissue is abundantly developed. The colon bacillus is looked upon as a secondary invader and experimentally it is almost impossible to produce appendicitis by introducing these bacilli into the blood stream without injury to the mucous membrane of the appendix. Rosenow's work is another link in the chain of evidence that attacks of appendicitis as well as other affections of the abdominal viscera are most probably produced by bacteria which find their way into the circulation from a focus of suppuration, in the teeth, tonsils, or other portions of the upper respiratory and gustatory tracts. See BACTERIOLOGY.

APPLES. See HORTICULTURE.

AQUEDUCT. The Catskill Aqueduct supplying the city of New York was practically completed at the end of the year 1915, and its use to supply the city with water was predicted for the following year, although it was expected that most of the time tests of the installation and equipment would be required and general practice in its operation concluded. In fact at the end of 1915 Catskill Aqueduct water was entering into the distribution mains of the city so that the testing and general tuning up of the system could be undertaken. The last step in the construction of the aqueduct proper was the building of a by-pass tunnel around the leaky section of the Moodna pressure tunnel on the west bank of the Hudson River, just previous to where the line of the aqueduct passes beneath the river bed. The new tunnel, 17 feet in diameter and 900 feet in length, was driven 400 feet below the original section. The old shaft which had been sealed was used in handling the material, and a new shaft was sunk from the old tunnel to make the connection with the supplementary tunnel below. The old sections were sealed and the new portion was found in satisfactory working order by the end of the year.

Large quantities of water were stored in both the Ashokan and Kensico reservoirs.

The Kensico Dam was nearing completion, and it was expected that within two years at the outside it would be entirely finished. This dam had reached a point where the architectural features of its exterior could be appreciated, and it was unique among American structures of this class for the fact that some pains had been spent in its ornamentation, and the massive masonry structure was architecturally treated so as to afford a pleasing appearance.

Quite in contrast with the Kensico Dam and Reservoir was the Hill View Reservoir, of 900,000,000 gallons capacity, which serves as a pressure equalizing reservoir for the aqueduct system, and at the same time affords two or three days' supply for the city or for emergency use in case of a large fire or other service. This reservoir is formed by earth embankments and required about 3,000,000 cubic yards of excavation. It is an earth embankment with an impervious 4-inch inner-face of concrete. It began to fill on Nov. 30, 1915.

The flexible submarine pipe line under the narrows of New York Harbor carrying the water from Brooklyn to the Borough of Richmond was also completed, while the Silver Lake Reservoir on Staten Island was more than half finished.

The distribution tunnels under Manhattan were completed at the end of the year though work remained to be done on the distribution system, and the connections, valves, etc. The city tunnel was under pressure as far as the shaft near 93rd Street, and tests were beginning to be made of the connection with the distribution mains in the city streets.

LOS ANGELES. With the successful completion of the Los Angeles Aqueduct the problem of disposing of the surplus waters interested the government of that city. During the year a district involving more than 100,000 acres, including all the irrigable area of the rich San Fernando Valley, between the northwestern limits of Los Angeles and the outlet of the aqueduct, and extending west of the aqueduct, voted to annex itself to the city of Los Angeles. This district agreed to assume a proportionate share of the cost of the aqueduct in addition to \$2,660,000, previously voted for the installation of a distribution system of steel pipes. The Los Angeles Water Department immediately began on the construction of a temporary unlined conduit from the lower San Fernando Reservoir, so that some 10,000 acres could be put under irrigation immediately.

In connection with the plan of developing power from the Los Angeles Aqueduct, the first hydraulic plant in the proposed chain of stations was built in the San Francisco Canyon for a 100,000 volt transmission line to convey current to the city 47 miles distant. This plant was designed for six 7500 kilowatt units working under a head varying from 914 to 814 feet. This plan was made possible by the California State Supreme Court validating a \$6,500,000 bond issue, of which \$1,250,000 was for completing the generating station and transmission line, and \$5,250,000 for providing or acquiring the distributing system in Los Angeles.

SAN FRANCISCO. During the year 1914 work was begun on the much discussed Hetch Hetchy water supply project for the city of San Francisco. A main road was constructed to the dam site, 9.09 miles, and a saw mill was erected for utilizing timber in the area owned by the city. A diversion dam was to be constructed to direct the waters of the Tuolumne River into a tunnel around the main dam site while the large impounding dam was being constructed. This dam was to be of gravity section, arched to afford additional safety, and was estimated to cost approximately \$4,000,000, but the plans were only tentative and were subject to final approval by the expert engineer to be named by the city. These tentative designs called for a structure 750 feet long on the crest and 300 feet in height. Work was begun on the Early intake which is a tunnel through rock 10½ to 13 feet in diameter, 20 miles in length, extending from a point 12 miles below the dam to a forebay above the Moccasin Creek power plant; and also on the diversion tunnel, 20 feet in diameter, to the Tuolumne River, during the construction of the main dam. In addition to the water supplied to the city a power development was planned which will ultimately develop a total of 72,000 kilowatts. For the construction, a railway 67 miles in length extending from the junction of the Sierra Railway at Rosasco to the dam, has been decided upon, as the transportation of much material will be required in the construction.

CANADA. Winnipeg. During the year 1915 the project for the construction of the 100-mile Winnipeg Aqueduct was thoroughly organized and work was begun. The general plan was recommended in 1913 by a board of consulting engineers consisting of Rudolph Hering, Frederick P. Stearns, and James H. Fuertes, and comprised essentially a low diversion dam at Indian Bay, an arm of Shoal Lake; 85.036 miles of horseshoe-shaped concrete aqueduct, the largest section of which is 10 feet, 9 inches wide and 9 feet high inside; some 10 miles of 5-foot steel pipe; 900 linear feet of tunnel under the Red River; and 12,000 linear feet of cast iron pipe leading to the city reservoir. The carrying capacity of the aqueduct is 102,000,000 gallons in 24 hours, which will be an ample supply through the year for 850,000 inhabitants. This aqueduct was to supply not only the city of Winnipeg but several municipalities which combined to form the Greater Winnipeg Water District, though of course Winnipeg, with a population of 200,000 out of 225,000 in 1913 in the area to be supplied, is the largest consumer, the other cities being St. Boniface, Transcona, St. Vital, Assiniboia, Fort Garry, and Kildonan.

The work requires the construction of a railway about 105 miles long, including sidings, the last spike of which was driven on Dec. 17, 1914. The estimated cost was \$13,045,600, and the plan of construction was somewhat novel in that the aqueduct administrative board in behalf of the district not only builds and operates the construction railroad, but purchases all cement directly, supplies the contractor with sand and gravel, and will grade this material in the proper proportion for use as concrete aggregate. The direct purchase of the cement was decided on in order to secure uniform sound waterproof construction.

The construction of the aqueduct naturally has been influenced by topographical conditions. Near the district to be supplied the ground and river water is so hard that it is unsuitable for manufacturing and laundry purposes, and not very satisfactory for domestic uses. The nearest suitable water supply was to be found to the east and north of Winnipeg, in the granite country, at about 300 feet higher level than the city. Consequently the available slope is only about 3 feet to the mile, and this head is consumed in delivering the water into the city reservoir. It was hoped that the aqueduct would be finished before the fall of 1918, and the whole organization of railway and construction was so provided that there would be as little chance for delay as possible.

Brooks Aqueduct. An interesting feature of the great irrigation development in the Province of Alberta, Canada, was the Brooks Aqueduct, which is the first aqueduct in which the hydrostatic catenary has been adopted for the shape of the water section, and it is the longest aqueduct yet constructed, with a large carrying capacity, having a length of 10,500 feet, and a capacity of 900 cubic feet per second. This aqueduct forms a part of the western section of the Bow Valley irrigation block, which includes the horseshoe bend on the Bow River at Bassano, where the great dam is located, and Lake Newell, an artificial reservoir constructed in a large natural hollow.

The water section of the aqueduct was selected in the form of a hydrostatic catenary or curve,

as the total fall was limited to 4.85 feet in 10,000, and consequently it was necessary to use this small head to the very best advantage. This shape afforded a low friction head and structurally was economical. To carry the water conduit various arches and trestle designs were worked out, but the trestle system was chosen, as this was found about 25 per cent cheaper than arches.

Ottawa. During the year progress was made towards increasing the water supply of the city of Ottawa, the result of a threatened 50 per cent increase in fire insurance rates which had aroused the efforts of local insurance interests and the Board of Trade. Contracts were let during the year for building a pumping station on Lemieux Island in the Ottawa River, and laying a force main thence to the mainland, crossing the river channel on a bridge in order to avoid the dangers of a submerged pipe line beneath Nepean Bay. This was the fifth water supply project proposed for the city of Ottawa within a few years, as the voters had defected bond issues for a near-by lake gravity supply and for a mechanically filtered supply from the Ottawa River; while the city administration had discarded plans proposed for a distant-lake gravity supply and a modified filtered supply from the Ottawa River.

ITALY. The great Apulia Aqueduct, which was being constructed to supply water from the river Sele to about 3,000,000 inhabitants of cities and towns in several arid provinces in Southeastern Italy, was put to use on April 13, 1915, when water was turned in. The project, which involves the construction of an aqueduct and many branch lines, with a combined length of about 1800 miles, was not completed and construction was being continued. This project dates back to 1868, and has involved many extensive surveys and geological examinations of the territory from which the supply is drawn. The general plan involves the collection of water by means of a series of canals which lead into a connecting canal, and this in turn into a supply canal. The main canal runs from Caposele to Fasano, a distance of 132.67 miles, of which 6.02 miles are tunnel, 5.28 miles canal bridges, and 4.59 miles are siphons. The supply of water from the main canal goes to 260 towns and three provinces in Apulia, through a system of branch canals, independent reservoirs, pumping stations, pipe lines, siphons, and tunnels. The construction of this wonderful aqueduct has involved extraordinary masonry and concrete work, tunneling, and other varieties of constructive engineering.

INDIA. The Gaulapar Aqueduct, which carries a supply of water for the irrigation of 7000 acres of Bhabar land, on the east of the Gaula, in the Haldwanitahsil, was opened during 1915 by the Viceroy of India. This aqueduct includes probably the second largest reinforced-concrete arch in the world. Twelve concrete-arch bridges and aqueducts had been built in the Tarai estates by the Indian Irrigation staff. The Gaulapar Viaduct was designed and carried out by Mr. W. L. Stampe, executive engineer of the Tarai and Bhabar government estates, and the construction was commenced in November, 1914.

ARABIC CASE. See UNITED STATES AND THE WAR.

ARBITRATION, INTERNATIONAL. See INTERNATIONAL PEACE AND ARBITRATION.

ARBITRATION, LABOR. See RAILWAYS.

ARBITRATION AND CONCILIATION, INDUSTRIAL. The large number of strikes during the year brought clearly before the country the fact that in addition to loss in actual money and lives, millions are lost in disrupted productivity, deterred investment, crippled business, and animosities bred by strife. The violences of Colorado, West Virginia, and New Jersey do not confine their harmful effects to those States, but make a direct appeal to the sympathies of all workers and employees in the United States, thus intensifying the class struggle. For this reason there never was a time when more general public interest attached to various plans for collective bargaining. This principle embodies the right of laborers to sell their labor as a whole and not individually. About 350 employers testified before the United States Commission on Industrial Relations, including such great captains of industry as J. P. Morgan, John D. Rockefeller, Jr., and George W. Perkins, and freely admitted that the employing side of business should be conducted on a collective basis. Many also admitted that labor had the right to organize and yet as a result of an antagonistic attitude toward such organization on the part of some employing concerns, employees remained unorganized. The trouble seems to lie in the fact that collective bargaining is conceived in terms of unionism, closed shop, and walking delegates, and there does not seem to be a comprehension of the fact that a compromise exists which will safeguard the rights of the employer and the worker without injustice to either. The Hart, Schaffner, and Marx clothing house of Chicago, which was one of the two large houses not entering the Chicago clothing strike (see STRIKES AND LOCKOUTS) of the latter part of the year, was converted to a system of arbitration some time ago. Mr. Schaffner said, "Industrial peace will never come so long as employer or employee believes he is being deprived of rights honestly belonging to him. Arbitration and conciliation should be applied to all departments of business wherever there is a conflict of interests. It insures exhaustive discussion of every matter of importance, gives everybody a chance to express his opinion, brings to light valuable suggestions, and makes possible a higher degree of coöperation and team work." Where collective bargaining has been tried it has uniformly resulted in increased efficiency, higher productivity, higher wages, and higher dividends. The retention of the traditional autocracy of the employer is thus an impediment to industrial progress from the standpoint of his own interests as well as those of his employees and the public. It is worthy of note that although the members of the Commission on Industrial Relations (q.v.) split into various factions, they all agreed in approving collective bargaining.

DEPARTMENT OF LABOR. The act of March 4, 1913, creating the Department of Labor, provided that the Secretary of Labor should have power to act as a mediator in labor disputes. Under this authority the Department, through its commissioners of conciliation, offered its services during the year ending June 30, 1915, in 32 labor disputes involving nearly 100,000 workmen. Of these disputes 24 were amicably adjusted. In five settlement was pending, two could not be settled, and in one mediation was

refused. From July 1 to Nov. 13, 1915, the Department handled 42 disputes involving over 40,000 workers. These disputes comprised a wide variety of industries and processes, as pattern making, dyeing and mercerizing, silver plating, boiler making, iron molding, wireless operators, steam and electric railways, textile mills, plumbing, coal mining, and the manufacture of firearms, lace, locks, and graphophones. Among the notable disputes settled by the Department was that in the Eastern Ohio coal field of more than a year's duration and involving 16,000 men (see STRIKES AND LOCKOUTS).

WESTERN RAILROADS. The most important single instance of arbitration in the United States during the year was that at Chicago involving the 64,000 locomotive engineers, firemen, and enginemen of 98 western railroads. An arbitration board consisting of the vice-presidents of the Illinois Central and the Burlington roads, representatives of the Brotherhood of Locomotive Engineers and the Brotherhood of Firemen and Engineers, Secretary of Labor Nagel, and Judge Pritchard of Virginia, chairman, reached a compromise agreement April 30. The employees' representatives refused to sign the award, which covered wages, overtime, transfers, seniority, pay for delays, and other items. The award holds for one year only, when it is expected the contest will be renewed.

COLORADO INDUSTRIAL DISPUTES INVESTIGATION ACT. The Legislature of Colorado enacted a law embodying provisions relative to labor disputes that differs from any other existing legislation in this country and resembles in several respects the well-known Canadian Industrial Disputes Investigation Act. The act creates an industrial commission with a wide range of powers. Among the duties is the promotion of the voluntary adjustment of labor disputes, with a view to avoiding the necessity of resorting to strikes, lockouts, boycotts, blacklists, discriminations, and legal proceedings in matters of employment. The commission may act directly, or it may appoint temporary boards of arbitration, providing also for their necessary expenses. Power to enforce the attendance of witnesses, administer oaths, and other court powers are conferred on the commission or a board appointed by it. Parties to proceedings may be compelled to give evidence as witnesses, and evidence is not restricted to that of a strictly legal nature, but such as seems to fit in equity and good conscience may be accepted. Employers and employees must give at least 30 days' notice of any intended change affecting conditions of employment as regards wages or hours. If an investigation has been begun, and until the dispute has been finally dealt with by the commission or board, the existing status must be maintained, and the relationship of employer and employee continued "uninterrupted by the dispute." Any attempt at delay in order to maintain a continuation of the status is punishable as a misdemeanor. It is also unlawful for an employer to declare or cause a lockout, or for an employee to go on strike, prior to or during an investigation, hearing, or arbitration of such dispute. Employers may declare lockouts and employees may strike without violating the statute if they choose to do so after a dispute has been duly investigated, heard, or arbitrated. Determinations by the commission or a board are binding only when the parties to a dispute have

either agreed in writing prior to action that they will abide by the conclusion reached, or have accepted the action of the commission or board after the same has been made known to them. Penalties are provided for violations of the act by employers or by employees, as well as by any person who incites employers or employees to act in contravention of the law.

ROCKEFELLER PLAN. Following the conclusion of the strike in the Colorado Fuel and Iron Company's camps, Mr. John D. Rockefeller, Jr., during an extended inspection of conditions, presented his Industrial Representation Plan whereby he thought to create a "Republic of Labor," in which every citizen is to be free and independent. This is a very comprehensive scheme for handling all of the relations of employers and employees. It is based on the theory that every corporation is composed of four parties, namely, stockholders, directors, officers, and employees, whose interests are so mutually bound together that an "effort to advance one interest at the expense of another means loss to all."

The plan provides for an annual meeting of employees for the election of representatives. Each camp is to choose one representative for every 150 wage-earners, the balloting in such elections to be secret. The camps are divided into five districts, and district conferences are to be held within two weeks following the annual election of representatives and within every four months thereafter. In such conferences the representatives of employers shall not exceed the number of representatives of employees. These conferences shall consider all matters of mutual interest, including working and living conditions, discipline, the avoidance of friction, promotion of efficiency, and of friendly relations. These conferences shall provide for the following four joint committees of six members each: on industrial coöperation and conciliation; on safety and accidents; on sanitation, health, and housing; on recreation and education. Each of these committees may of their own initiative consider all matters in any way pertaining to the general field.

The settlement of industrial disputes is dealt with at great length in the plan. In the first place it is provided that the company and its employees shall strictly observe the Federal and State laws. In the second place there is to be no discrimination against an employee on account of membership in any union or society; but all features of the management of the business are reserved exclusively to the company. Offenses for which an employee may be dismissed shall be conspicuously posted at each property. Employees may assemble outside of working hours at appropriate places on the company property or elsewhere. They are not obliged to trade at company stores. They may employ checkweighmen. Finally, elaborate provision is made for a series of appeals for any grievred employee. The plan provides that the president of the company shall have a special industrial representative who must visit each camp at least once every three months. The plan then provides that adjustment of a grievance shall be sought first with conference through the mine superintendent; then through the president's industrial representative; then through the division superintendent, assistant manager, or manager, general manager, or presi-

dent of the company in consecutive order. If all these fail the joint committee on industrial mediation and conciliation of the district shall take up the case. If they divide evenly on the matter they shall call in an umpire. If this does not succeed the matter may be referred to arbitration or made the subject of investigation by the State Industrial Commission.

Considerable attention is given to social and industrial betterment. A special executive assistant to the president is to coöperate with a permanent advisory board with reference to sanitary, medical, educational, social, religious, and other needs of the various communities. The publication of a periodical to serve as communication between the management, employees, and the public is also provided. The first quarterly number of this periodical, called the *C. F. and I. Industrial Bulletin*, was issued in October.

In addition to these general features the plan provides special features of an agreement to continue in force until Jan. 1, 1918, and thereafter subject to revision upon 90 days' notice by either party. These special features include the charges for dwellings, electric light, water, powder, and domestic coal; agreement of the company to fence lots for gardens and to remove garbage; and to provide bath houses and social centres. An eight-hour day for underground employees, and a nine-hour day for others is established. Wages are not to be reduced during the term of the agreement, but may be raised in proportion to the advances in competing districts.

The plan includes three of the seven demands presented preceding the strike of 1913-14, and a part of a fourth. It does not recognize the union, advanced wages, nor pay for dead work, while the abolition of the guard system is not touched upon. While Mr. Rockefeller claimed the plan to be "more democratic than unionism," critics did not believe it afforded adequate protection to representatives of the men serving on committees, nor indeed of any workers deemed too active. Moreover, while the company assumed the expenses for the operation of the plan, it at the same time retained complete control. It was believed thus to introduce a degree of paternalism and guardianship not entirely in harmony with free democratic institutions. Moreover, the plan did not include the several thousand employees of the company in the steel works at Pueblo. The plan was, however, unanimously adopted by representatives of the company and of employees at Pueblo on October 2. It was then submitted to the directors of the company and to a referendum vote of the miners, being approved in both cases.

NEW YORK CLOTHING INDUSTRY. One of the most elaborate and effective trade agreements ever completed in the history of American industry was the protocol established between the Cloak, Suit and Skirt Manufacturers' Protective Association of New York City and the International Ladies' Garment Workers' Union and the Cloak and Skirt Makers' Union in September, 1910, and continuing to May, 1915. Termination of that agreement led to strikes and threatened disruption of the industry, with the result that Mayor Mitchel appointed a council of conciliation with a view to establishing a new collective agreement. This council consisted of Felix Adler, chairman, Charles L. Bernheimer, Louis D. Brandeis, Henry Bruère, George W.

Kirchwey, and Walter C. Noyes. They secured the adoption of a new agreement to be in force for two years with renewal for a like term unless two months' notice of desire to abrogate is given by either party. A wage scale representing an advance of approximately 10 per cent over the preceding agreement is fixed. The Union agrees to avoid strikes, but the workers are guaranteed "an inalienable right to associate and organize themselves," and shall be immuned from discharge or discrimination on account of union activities. Complaints shall be investigated first by representatives of the two parties, and, if settlement is not reached, by a trial board consisting of one employer, one worker, and an impartial person. The employer, on the other hand, is given complete freedom in the selection of employees; the right to discharge the incompetent, the insubordinate, the inefficient, the unsuitable, and the unfaithful (which, however, he agrees not to exercise in an oppressive manner); the right to distribute work among the employees possessing the requisite skill; but he agrees to distribute work during slack seasons as equably as expedient; and he may reorganize his shop whenever conditions of business make it necessary for him to do so. The council which planned this agreement was requested by the mayor to continue as an investigating commission in order to increase the regularity of the industry, fix wages and other standards, and encourage trade education and more thorough organization throughout the industry.

DENMARK. Denmark recognizes practically the same principles of State interference in the settlement of labor disputes as does the Australian Commonwealth. A permanent arbitration court was established by the law of April 12, 1910. It consists of 12 members. Three associates and their alternates are elected annually by the Association of Danish Employers and Masters; the other three and their alternates are chosen by the Danish Federation of Labor, as long as these organizations represent the majority of employers and workmen on either side; and when they cease to do so, steps are to be taken for a change in the law. Since the organization of the court, 136 cases have been decided by it. During the years 1913-14, 48 cases (24 in each year) were referred to the court for decision. During the same years 31 proceedings were begun by employers' associations or individual employers, and 17 by trade unions; 8 cases were settled by the parties before final proceedings were had, 4 were dropped, and 1 was postponed. During the same two years, the largest number of disputes occurred in the building trades, where 22 cases were represented; transportation and the woodworking trades came next with 7 and 5 cases, respectively. The questions at issue were strikes and lockouts in 20 cases; interpretation of agreements or awards in 17 cases; alleged boycotts, 5; working conditions, 2; wages, 1; blacklisting or dismissal, 1; employment of non-unionists and non-compliance with the award of the court, 1. Fines were imposed during 1913 and 1914 in 15 cases, amounting approximately to \$1207. The total costs involved in the settlement of the 48 cases during the same two years amounted to \$1217, of which \$282 was assessed on employers alone, \$662 upon trade unions alone, \$229 upon both employers and trade unions in equal

amounts, while \$44 was assessed upon both parties unequally.

NORWAY. The enactment, Aug. 6, 1915, of an arbitration law in Norway is of special interest, as it recognized the principle of compulsory investigation and enforced delay in striking, which forms the essential feature of the Canadian Industrial Disputes Act of 1907. As originally drafted, the Norwegian law was a compulsory arbitration law, but opposition to it from the time of its proposal in 1910 compelled the omission of the compulsory feature. For its purposes, the law provides for the registration of trade unions and employers' associations and the legal recognition of the collective agreement; conciliation is a prominent feature of the act. In order to incorporate, a trade union must have at least 25 members. Collective agreements are required to be in writing and remain effective for three years unless otherwise provided, and three months' notice is required before their lawful termination. It is specifically provided that an individual contract of hire cannot waive the provisions of the collective agreement. Resort may not be had to a strike for determining the application or intent of a collective agreement, nor may it be resorted to under any circumstances unless conciliation proceedings be first attempted; and as long as the right to strike is in abeyance, it is not lawful to make changes in the conditions of work or wages of the employees, a provision inserted to prevent a so-called masked lockout. The labor court established under the act is the only tribunal before which the questions arising from an unlawful strike may be tried; but the parties themselves are left free to settle their disputes out of court by voluntary arbitration. The organization as such, and not an individual representative of it, is alone recognized before the court. The court consists of a chairman and four associates appointed by the Crown for a period of three years, two being nominated from trade-union members, and two from employers' associations. The country is divided into conciliation districts, at the head of each of which is a conciliation board. It is obligatory to report every actual or threatened cessation of work to this board. Fines ranging from 5 crowns (\$1.34) up to 25,000 crowns (\$6700) may be assessed against an employer or workman who takes part in or assists in an unlawful labor dispute.

SWITZERLAND. The new Swiss Factory Act provided for permanent cantonal conciliation boards. These boards may intervene in a dispute either on their own initiative, or at the request either of the parties concerned or of the local authorities. The boards have the right to compel the attendance of witnesses and to conduct investigations under oath. These conciliation boards are established for settling disputes only in private industries, while a special permanent committee, entitled "the Government Workshops Committee," is appointed to inquire into the claims of labor in government workshops and departments. The functions of this body are purely advisory, the power of action lying wholly with the Federal Council. The Government Workshops Committee has no authority in connection with the Federal railroad system. The conciliation boards and the government committee both contain representatives of employers and of employees.

GREAT BRITAIN. The Australian system of arbitration was suggested for Great Britain during the war period. A conference was held about the middle of 1915 between the representatives of the government and labor, 35 workmen's organizations being represented. It was agreed that there will be no stoppage of work on munitions or equipments of war. Differences on wages and conditions of employment shall be subject to conference between parties. In the case of failure to reach settlement there are three possible means of dealing with the situation: 1. Reference to the Committee on Production; 2. reference to a single arbitrator agreed upon by both parties or appointed by the board of trade; and 3. reference to a court of arbitration upon which labor is represented equally with employers. A threatened strike at the Vickers Naval Construction Works was settled by arbitration; a dispute involving 12,000 men engaged in admiralty work at Southampton was compromised.

After a conference between the executive council of the miners and the representatives of the government in the strike of the Welsh coal miners, tentative terms were agreed upon, including a new standard rate of wages, payment for overtime, abolition of the maximum wage; these terms to be operative until six months after the close of the war, then to be terminated by the government or miners on three months' notice.

AUSTRALIA. The war caused considerable disturbance in industry in 1914 and it became a problem for the different conciliation boards to meet the demands for increases in wages in the making of new agreements. The question was appealed to the Industrial Arbitration Court. The court declared that government employees must not look for higher wages. As to other workers, increases should not be asked for which will prove detrimental to public interest. Community interests were emphasized as being of the greatest importance in deciding disputes.

ARCHÆOLOGICAL INSTITUTE OF AMERICA. The seventeenth general meeting was held in conjunction with the American Philological Association at Princeton, N. J., on Dec. 28-30, 1915. A joint session with the Society of Biblical Literature and Exegesis was held in Columbia University, New York, on the afternoon of Dec. 28th, and a joint session with the International Congress of Americanists was held in Washington, D. C., on Dec. 31st. The annual meeting of the council of the Institute, and meetings of the managing committees of the American School of Oriental Research in Jerusalem and the School of American Archæology were also held. A special meeting of the Archæological Institute was held in San Francisco, Aug. 2-5, 1915, in connection with the Panama-Pacific Exposition, and in conjunction with the American Association for the Advancement of Science. Sessions were held at the University of California and Leland Stanford University, and an adjourned meeting took place in San Diego, August 11-12, under the auspices of the San Diego Society of the Archæological Institute. Tuesday, August 3rd, was Archæological Institute Day at the Exposition, and President Shipley was presented with a bronze medal in honor of the occasion. Among the papers read were: "The Architecture of the Panama-Pacific

Exposition," by Eugen Neuhaus; "Spanish Colonial Architecture at the Panama-California Exposition," by Carleton M. Winslow; "Aspects of Neolithic Culture of the Santa Barbara Channel Islands, California," by Hector Alliot; "Roman Portrait Sculpture," by F. W. Shipley; "The Relation of Religion to Art in Antiquity and the Middle Ages," by Osvald Siven; "Ghiberti's Gate of Paradise in Florence," by George Bryce; and "Archæology of the Panama-California Exposition," by Edgar L. Hewett. The president of the Institute is F. W. Shipley; secretary, Mitchell Carroll; Willard V. King, treasurer. Besides the School of Oriental Research at Jerusalem, the Institute maintains the American School at Athens and the School of Archæology at Santa Fé, N. Mex. It has about 3500 members.

ARCHÆOLOGY. The great war has had its effect upon the activities of the scholars who in the past busied themselves with archæological investigations. In Turkey, for example, it has been impossible to carry on excavations, not only because of the unsettled state of the country, but also because the need for troops has withdrawn men from the localities where work has been carried on. Mesopotamia, now a field of combat, is no place for excavation, and at Sardis, where the Americans have been engaged for several years, it has been necessary to give up work, both because of the unsettled conditions there and because of the lack of laborers. In France, Germany, and England, no archæological work has been done: and in the past some excavation has always been done there. In Italy, too, there has been no archæological research. See also **PEABODY MUSEUM**.

On the other hand, the war has in a curious way been responsible for at least two discoveries of archæological interest. The first of these was made in the Necropolis of Eleantos in the peninsula of Gallipoli. On May 15th, during the fighting, a shell of large calibre, fired by the Turks, in exploding, blew open an excavation of considerable size behind the Allies' lines and laid bare a remarkably well preserved sarcophagus. Upon enlarging the opening thus made by the shell the Commandant Vermeersch found in addition to the sarcophagus a number of tombs and vases dating from the fourth century B.C. Among the finds were many terra cotta figurines of the Myrin type and of exceptional beauty. Particularly interesting was the discovery of two great jars, or pithoi, 1.60 m., both with an opening .50 cm. broad, which contained two skeletons each. The suggestion made is that these were the tombs of a couple of married people or lovers.

The second discovery referred to was made on the Island of Lemnos, where French troops were stationed. Here at Palaiapolis ("old town") on the northern side of the island and facing toward Samothrace, the soldiers in digging a trench uncovered a statue of Eros two-thirds life size. The head, right arm, the left as far as the elbow, and both legs were missing.

EGYPT. Work in Egypt apparently, in spite of the rumors reaching this country of unrest in that quarter, has been carried on much as before. At Ballabish, near Nag' Hamâdi, in Upper Egypt, the work of the Egyptian Exploration Fund has met with success. The work is being carried on under joint Anglo-American direction, and reports already show that Professor Whittmore has found a number of graves

which have been excavated. These are "pan" graves and they contained a vast quantity of pottery, chiefly of the twenty-sixth dynasty or later. They throw interesting light upon the burial customs of the common people of that period.

Acting on behalf of the Museum of Fine Arts in Boston and Harvard University, Dr. Reisner has just published the results of the work at Gizeh in 1914. One of the results of the work was the identification of the royal cemetery of Chefreu (Khafra), and the proving that the custom of placing magical "reserve heads" of the dead in the tombs dates in this period. Among these heads some especially fine ones were recovered—notably that of a princess and one of Prince Sneferu-senb. Two heads of foreign type led Reisner to argue that Egypt experienced an early infiltration of stock from Syria. This was demonstrated, he believes, by the discovery in the tombs of strange vases of hard reddish clay similar to those found in first dynasty tombs at Abydos. Petrie believed them to be of Ægean origin. Reisner thinks them Syrian. The portrait heads referred to above are of especial interest, not only because of their lifelike quality, but also because there seems to be some reason for believing that they indicate that sometime during the fourth dynasty, 2900–2750 B.C., Egyptian blood experienced negroid contamination. Some of these heads came to light in 1914.

At Harêt, Dr. Breccia cleared out the pylons of the first doorway of the temple of Sebek. On the cornice was found an inscription which stated that the vestibule and the pylon had been dedicated in the 34th year of Ptolemy Euergetes II (B.C. 137) to the deity Pnephērōs (P-nefer-ho, 'the beautiful-faced') or Soknopaios, in honor of Ptolemy and his consort Cleopatra and their children, by one Agathodoros and Isidora his wife, citizens of Alexandria. In place at the entrance which led into a large outer court, were found two crouching lions. Around the sides of this court were numerous doorways opening into various apartments. The walls had been covered with stucco except in certain places, where spaces were left for the insertion of paintings. Of these paintings the only one in a good state of preservation exhibits a procession of Pnephērōs. In it the god appears as a mummified crocodile crowned and borne by priests upon a stretcher, while other priests, some with palms or flowers, participate in the ceremonial. In the same court two sphinxes stood on guard at another doorway, which led into a smaller room. Beside this doorway was found a column bearing an inscription which tells that it was erected by the corporation of water-bird breeders in honor of Ptolemy X and Cleopatra III. A third court, entered through a pylon, had on one side a figure of a warrior in full armor and an inscription saying that the dedication was an act of gratitude on the part of Heron Soubattos. The third court, into which this doorway gave access, opened into the principal chapel of the sanctuary, which contained a large and elaborate altar, and which showed upon its walls the figures of deities. The altar is a very important illustration of the furniture of an Egyptian temple.

The results of the excavations of the Metropolitan Museum at Lisht have just appeared. The work centred about the south pyramid, that is, the pyramid of Sesostri I (twelfth dynasty, about 1950 B.C.). On the northern side of the

pyramid temple two small pyramids were uncovered. One of these had been rifled. The shaft of the other was discovered at the south-west corner of the structure. It was 2 meters square and descended for 15 meters into the rock. At this depth a passage led off seemingly under the centre of the pyramid. This monument also had been rifled. Its chapel lay on the eastern side. As the excavation was carried on beyond the outer enclosure wall of the pyramid of Sesostri, a tomb was found near the causeway. This proved to be the burial place of Imhotep, one of the high officials of the King. It was a mastaba measuring 13 m. by 6 m., and was surrounded by a thick wall of sun-dried brick. In the paved area between the tomb and the wall were located two shaft burials which had been robbed in the past. One of the interesting finds in connection with these shafts was a rope some 11 m. long, which had been hastily braided by the robbers from strips of linen. The shaft of Imhotep's tomb on the northern side of the mastaba, 2.5 m. square, penetrated the bed rock to a depth of 15 m. Then in a southerly direction a passage led for some 5 m. into a burial chamber 4 m. square and 3 m. high. In the floor of this chamber a small sarcophagus chamber had been hewn in the solid rock and covered over with heavy blocks of limestone level with the floor. The tomb had been sacked.

One of the most interesting discoveries in connection with this tomb proved to be a chamber, about 65 cm. square, concealed in the thickness of the enclosure wall of the mastaba. It was roofed with planks and these covered with sun-dried brick. The interior of this small chamber was lined with pinkish plaster. The noteworthy part of the find was not the chamber, but two small royal figures carved out of cedar and identical, except that one wore the red and one the white crown. That with the white crown stood 56 cm. tall; that with the red crown, 58 cm. Traces of pinkish color remained on the nude portions of the figures, while the skirts and crowns were covered with stucco, the better to furnish a body for the color. Along with these two figures was found a small wooden shrine painted yellow, 58.7 cm. high by 31.5 cm. broad, and 22.5 cm. deep. It was closed by a bolt shot through copper staples in the double doors. Within it was an alabaster vase half full of a bluish ointment which had solidified. In this ointment stood a curious object which proved to be a cedar rod about 53 cm. long and 1.5 cm. thick at the point where it entered the ointment. This rod was carefully bound with linen wrappings which enclosed as well a "dummy" animal made up of skin and padding. It is believed to be the Anubis symbol; this and the other objects in the chamber are unique.

Work carried on eastward of Imhotep's tomb brought to light many tomb shafts. Among these, one particularly is interesting. It had never been disturbed and was a tomb of three chambers, all opening out of the same shaft at a depth of 6 m. In the northern chamber was found two wooden coffins, in one of which was the owner of the tomb with his walking stick beside him, and a little figure of the man himself. The eastern chamber contained but one burial, but the other, on the southern side of the shaft, was so packed with burials that the chamber was filled to the roof. Two coffins had

been even shoved in on their sides so as to be able to get them in.

To the south of the tomb of Imhotep the excavators found a series of house walls which seem to have been those of the houses of guardians and priests of the precinct of the temple.

At Memphis the Eckley B. Coxe, Jr., expedition has unearthed a temple which the excavators believe to belong to the period of Rameses II. The belief is held that it was erected by Seti I, and that it is the particular building described by Herodotus.

The expedition of the Metropolitan Museum of Art at work at Thebes has devoted particular attention to clearing the tomb of Surer, the scribe and fan-bearer of Amenhotep III, the heretic king. The tomb, quite elaborate in its organization, consists of these features, all hewn from the rock. After passing through a courtyard one enters a transverse hall, the ceiling of which is supported by 20 fluted shafts of the proto-Doric type. This part had been cleared two years ago. From this transverse hall one then passed into an inner hall, the axis of which was at right angles to the preceding, 74 feet long, and divided into three aisles by 20 lotus-bud columns. In this hall was found a papyrus manuscript containing an account of a suit between two women over a slave girl. Proceeding still further inward one enters another hall, somewhat rougher in execution than the others, containing four rows of 20 lotus-bud columns of that ungraceful type in which the bud is inverted. Finally, behind this last room one comes to a pillared hall, excavated only to one-half its height, with three aisles of six piers.

An interesting feature in connection with this tomb is the fact that the name of Surer, the owner, had been scrupulously eliminated wherever it appeared in the inscriptions. Even the figure of the hapless man had been obliterated from a relief in which he was represented holding the fan for his royal master. The apparent reason for this is that Surer did not sympathize with Amenhotep, or Akhnaton, in his attempt to substitute the worship of the one god, the sun, for that of all others.

In the courtyard of the tomb were found several later burials, all of which had been pillaged. In one coffin the body of a woman had been crowded in on top of that of a man.

The same expedition also partially cleared the tomb of Puimre, also at Thebes. The tomb was located high on the face of a cliff. A close examination of the tomb showed that shafts and chambers ran in every direction, over, under, and even into each other. At one place, which was reached by a flight of stairs about 80 feet long, the chambers were three stories deep. In two large rooms the debris, made by earlier plunderers who had torn the bodies limb from limb, was knee deep. The tomb chamber of Puimre himself was at length discovered at a point deep in the rock and reached by a deep shaft that made down from the court, then by a sloping passage, two stairways, and finally through two intermediary chambers. The burial chamber itself was small, cut in the rock, and lined with slabs of sandstone to make it into a great sarcophagus. Even this had been robbed.

At Thebes, also, the same excavators cleared out the tombs of Userhêt and Thotemhab. During the clearing of the tomb of Nakht, the kneeling statue of Nakht, about 40 cm. high, was

found in the filling of the pit where it had fallen from a niche at the top. This statue was lost when the steamship *Arabic* was sunk.

GREECE. As might be expected, little has been done in the way of excavating in Greece. However, by making use of boys and old men, since the adult population for the most part is under arms, the American school in Athens has been able to carry on its work at Corinth. The excavations proved to be a godsend to the natives, owing to the lack of employment brought on by the war. The most notable finds made in clearing the Roman part of ancient Corinth consist in a draped statue of Augustus and of two youthful figures which are thought possibly to represent his grandsons. Experimental diggings in the neighborhood of Corinth have brought to light Mycenaean remains in six places. These remains consist of late pottery. As yet no great necropolis has been located. Some ruined walls of this Mycenaean period were also found. At Palaio-kastro, in Cephalenia, excavations have brought to light indications of a cemetery of the Mycenaean Age.

In Crete, the Greeks have opened the Tholass tomb at Platanos, in the Messara, in Southern Crete. Here were discovered two bronze votive double axes, diadems, necklaces, rings, and other gold objects, besides 70 bronze daggers (10 being of the primitive triangular form), 10 ivory and stone seals, and 370 variegated stone vases similar to those found by Seager at Mochlos some years ago. Among the particularly interesting discoveries were a small stone idol resembling those of the pre-dynastic period in Egypt, and an ivory seal showing two apes. This is the first appearance of such a device upon a Minoan seal. From these the early relation of Crete and Egypt is thus established and they explain the similarity noted between certain early Cretan stone figures and those of wood or ivory that have been recovered from early pre-dynastic cemeteries in Egypt.

ARCHIBALD, F. J. See U. S. AND THE WAR. **ARCHITECTURAL LEAGUE EXHIBITION.** See PAINTING AND SCULPTURE.

ARCHITECTURE. Everywhere but in the United States, and sporadically in other neutral countries, the toll of war was laid heavily upon architectural progress during 1915. European effort was practically at a standstill in all the belligerent countries except England and Germany. In the former, due to the availability of men in the absence of any system of universal military service, a certain amount of building activity was apparent, although no great project of permanent value had been undertaken; and toward the end of the year even this little activity began to ebb out. In Germany, by a seeming trick of circumstances, the output was very nearly normal in all but monumental structures, and large public buildings and dwellings, but there were numerous competitions under way for schools, churches, city halls, and hospitals, not to mention various civic extensions—totaling in the case of Berlin alone no less than \$75,000,000 for improvements to be undertaken at once. France, Italy, and the other nations at war produced nothing; in these countries even the periodicals in most cases suspended, or devoted their pages to historic buildings, restorations, and the like, as had been done for some time in the publications of the other nations as well. In the United States the year's contribu-

tion was not highly commendable, though very nearly normal in quantity. Many buildings, even under the conditions of reduced output, must perforce be omitted in the succeeding paragraphs, but an attempt is made to strike a reasonable balance between quality and quantity in each country considered, a concise résumé rather than an accurate compilation. Since great reliance must be placed upon weekly and monthly publications in the preparation of such material, a goodly number of completed structures which are properly to be dated within the year 1915 cannot be included and must remain inedited until the succeeding issue of the YEAR BOOK.

UNITED STATES

American financial supremacy, as determined by American agricultural and industrial advancement, bade fair in a short time to close the hiatus of architectural inactivity that had characterized the years 1914 and 1915. There was current a persistent general feeling that the United States had weathered successfully the unsteady first effects of the gathering world storm that had all but snuffed out architectural growth in Europe. A noteworthy parallel was the increase in public confidence which invariably results in improved building conditions. That improvement had not been substantiated by any unprecedented number of new buildings; in fact, by way of discouraging example, the low tide conditions in New York City alone are well indicated by a single, though fortunately not representative, week in October, when but one set of plans for a new building had been filed for inspection. When it is recalled that New York's buildings cost over \$33,000,000 less in 1914 than in 1913, the report would lead us to expect but little of the year under review. On the other hand, San Francisco and Chicago were busy. The latter outstripped New York by about \$9,000,000 in the cost of its new buildings during 1914, and to the credit of San Francisco was placed the greatest increase in the country for the same period, over \$7,000,000. These amounts must be modified somewhat for 1915.

A survey of the field shows practically the usual quota of residences, perhaps slightly reduced in number for the first half of the year, when war profits had not been so definitely established. Of smaller private dwellings, whose owners would be most readily affected by money conditions, there were very few. The same may be said of theatres—with the exception of those devoted to films—monuments, and public buildings. On the other hand, there were erected a fair number of hospitals, schools, churches, clubs, and, to a certain extent, of office buildings; the output of apartment houses was practically normal.

Fortunately the decreased output has not resulted in any serious qualitative deterioration. American effort toward a proper expression of American needs must ultimately result in an American architectural language; each year contributes its quantum of study and interpretation, not to say of imitation of accepted older forms; but the insistent problems of our daily life demand an architectural outlet that older manners cannot offer, and American ability is ample and able to devise such an outlet, both practically and stylistically. Even a poor building year, such as 1915, bears nevertheless the

indication of the slow but well-defined trend toward the goal of style and utilitarian perfection, manifested by conservative advance in the East, by bold experimentalism in the West, by solutions many and varied in the greater municipal centres.

EXPOSITIONS. The whole field of architecture in the United States was dominated by the fabulous groups of the Panama-Pacific International and the Panama-California Expositions at San Francisco and San Diego, respectively. These demonstrated the true province of expositions as factors in life; not only to enhance industrial possibilities, nor only to acclaim a memorable achievement of international scope and value, but also to offer a thorough index of national strength, ability, and resource in architectural planning and design, a record by the nation's best architects and a school of examples for many years to follow.

Panama-Pacific International Exposition. To the municipal courage of San Francisco in living down the trials incidental to the earthquake and fire of 1906, but five years before the inception of its international project, the splendid Panama-Pacific buildings may be considered a fitting monument. The undertaking was financed to the extent of \$17,000,000 solely by residents of California, without the usual Federal subsidy. The architectural control devolved upon a commission of nine practitioners from different parts of the country. After much preliminary consultation with various government offices and many experts in construction, gardening, and the like, and after numerous conferences among themselves, the commission unanimously adopted the court plan, to be carried out on a site fronting the bay, near the Presidio Military Reservation, and overlooking the Golden Gate.

The work of grading and filling ground preparatory to the actual erection of units was one of the most extensive projects of the kind ever undertaken, for no less than 80 per cent of the whole site was involved. Of similar importance were the matters of piling and foundations, sewers and drains, tracks and roadways, ferry slips and piers, basins, lighting, planting. Full gauge railroad tracks during the period of construction ran into each palace; in fact, a tunnel was built under Fort Mason to facilitate connections with main railway lines. Separate ferry slips with regular service were likewise built, definite connection with transcontinental trains established, and a protected bay inlet provided for smaller boat traffic along the shores.

The plan was conceived on the basis of a single central circulation area or highly emphasized major axis, as was the case in previous expositions. The so-called court plan, however, which was adopted in the present instance, developed the whole project as a series of courtyards as the nuclei of design motives, rather than as a series of axially located buildings. Minor axes cut across the major artery at right angles and at each intersection a new court motive appears. As a result the various buildings took the keynote in design from the schemes adopted for the courtyards upon which they face. That is to say, as units in design, there were no buildings at all, but simply a series of coördinated courtyards. Thus, for instance, the Palace of Varied Industries was an agglomeration of five façades, determining the design of the

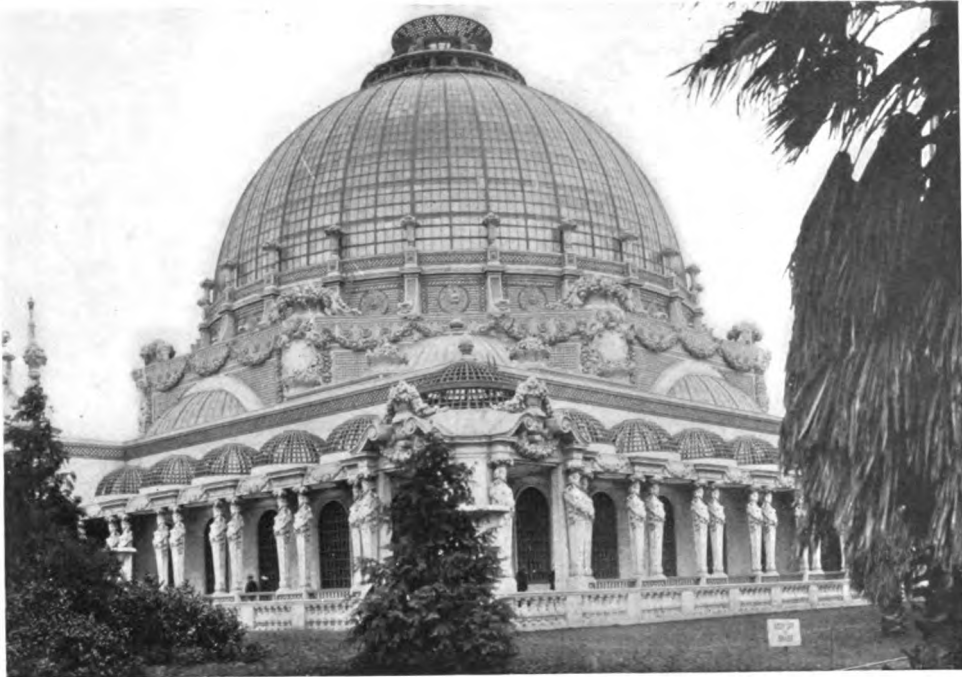
Court of Abundance, the Court of Flowers, the Avenue of Palms, the Avenue of Progress, and the Court of Mines. To understand the point of view properly, then, it is essential to conceive of courts and avenues only, and not of buildings, for the latter changed front chameleon-like in accordance with the surrounding open areas; thus each building in the main block, at least, was subject to four or five influences in design. While no general scheme of design in a definite sense controlled the whole exposition, the courts themselves were marvels of imagination and manipulation of ornamental forms; great ability likewise appeared in the mural paintings and sculptural units. The styles illustrated varied from a Spanish Renaissance-Gothic combination to Italian and French Renaissance, and from suggested Roman Classic to entirely novel conceptions, such as that of the remarkable Tower of Jewels, facing the southern gardens. In color scheme this exposition far outstripped its predecessors; a fine travertine texture and color prevailed, softening all high lights and eliminating glare. The night illumination was a wonder of ingenuity and colored light, both direct and indirect, reflected and diffused; most actual light sources were concealed, electric scintillators coming largely into requisition.

Panama-California Exposition. The splendid monumental quality of the San Francisco groups was not present at San Diego; it was, indeed, studiously avoided. Instead, there was at once apparent a picturesqueness and irregularity that found an immediate appeal. The treatment throughout indicated a more homelike quality concomitant with its more individual purpose of exploiting a single State; it had not an international purpose. The color scheme was a simple white without glare; the architectural style was uniformly Spanish-Colonial, involving the use of finely wrought detail relieved against plain wall areas. The plan maintained a principal east and west axis, and to a certain extent two minor axes. The former of these was El Prado, a broad roadway continuing the line of the Puente Cabrillo, an exceptionally attractive engineering feature bridging the deep canyon of a small brook, with a highroad and lake, all named after Cabrillo, the founder of the city of San Diego. The arrangement of buildings and squares was dependent upon the axes, but at the same time suggested a random feeling which was one of the exposition's greatest charms. Thus the great Plaza de Panama ran north and south, was of longish oblong plan, and made a right angle with the Prado, instead of forming in symmetrical fashion a regular widening of the main avenue; in the same manner the Plaza in turn narrowed into an Esplanade terminated by a hemicycle motive centring about a giant open-air organ. In both expositions the amusement concessions, as well as the areas devoted to cattle exhibits and athletic contests, were not accorded with the main scheme of design; but on the other hand, all concessions, as well as the spaces assigned to State Buildings at San Francisco or to County Buildings at San Diego, were carefully treated with reference to their own planning needs. At San Diego, especially, the natural features were of great advantage, the climate of Southern California being in fact a bona fide assistant in the work of construction. Judging the whole conception properly as a State exposition, the San Diego groups

must be considered an unqualified success. See also AGRICULTURAL EDUCATION; and BUILDING OPERATIONS.

CHURCHES. Ecclesiastic architecture during 1914 is not of certain trend; the decided domination of the Gothic of Cram and Ferguson, as well as that of B. G. Goodhue, is not much in evidence, although the mediæval styles are still in great favor. The Colonial manner is represented by one or two examples and the Italian Renaissance is well exemplified in two others. In general, however, the church building of the year is of modest proportions both in the number and quality of buildings. Several good plan solutions are noteworthy, as, for instance, those of Trinity Lutheran Church at Akron, Ohio, by J. W. C. Corbusier, and Christ Church, Los Altos, Cal., by Coxhead & Coxhead. Brick is finding always greater favor for the smaller church buildings, due in part to the more frequent use of the north Italian styles, both in Romanesque and in Renaissance. Good brick examples are Carrollton M. E. Church, New Orleans, La., by Sam Stone, Jr.; First Church of Christ Scientist, Los Angeles, Cal., by Elmer Grey; the Ravenswood Presbyterian Church at Chicago, by Pond & Pond; and the church and rectory of St. George, New York, by Robert J. Reiley. Among the best designed examples may be mentioned the quiet and attractive Chapel of Divine Love, Philadelphia, by Paul Monaghan; the Italian Romanesque St. Patrick's Church in the same city, by Lafarge & Morris; the House of Hope Presbyterian Church, St. Paul, Minn., by Cram & Ferguson; the Italian Renaissance Church of St. Vincent Ferrer, New York, by Bertram G. Goodhue; and the chapel of the Dominican Sisters of St. Agnes, Sparkill, N. Y., by Davis, McGrath & Kiessling. Other examples are: St. Mark's, Dorchester, Mass., by Brigham, Coveney & Bisbee; St. Henry's, Bayonne, N. J., by T. H. Poole & Company; First Congregational Church, San Francisco, by Reid Brothers; Emanuel Church of the Evangelical Association, in the same city, by Falch & Knoll; St. James's Presbyterian Church, New York, by Ludlow & Peabody; First Presbyterian Church at San Diego, Cal., by Robert H. Orr; First Presbyterian Church at Spokane, Wash., by L. B. Valk; First Church of Christ Scientist, Worcester, Mass., by O. C. S. Zirolì; St. Luke's, Evanston, Ill., by Lowe & Bollenbacher; First Church of Christ Scientist, Seattle, Wash., by Charles H. Bebb & L. L. Mendel; All Saints Episcopal Church, Newbury, Mass., by Clark & Russell; Plymouth Congregational, at Chicago, by Riddle & Riddle; St. Rita's, Philadelphia, by George I. Lovatt; St. Elizabeth's, Philadelphia, by Bailly & Bassett; the temple of B'Nai Jeshurun, at Newark, by Albert S. Gootlieb, is the only noteworthy synagogue erected during the year.

SCHOOLS. While the output of school buildings is not characterized by a memorable increase numerically, it is notable for the high quality of planning skill everywhere in evidence. At Coronado, Cal., Quayle Brothers & Cressey produced a particularly good result. The same may be said of Francis W. Parker School at San Diego, by Templeton Johnson. This is named after the well-known philanthropist whose benefactions in Chicago and generally in Cook County, Ill., have largely taken the form of school improvements. The school in question is



THE PALACE OF HORTICULTURE



FESTIVAL HALL—APPROACH FROM SOUTH GARDENS

PANAMA-PACIFIC INTERNATIONAL EXPOSITION, SAN FRANCISCO

of the southwestern patio plan, one story high, all rooms facing and actually open toward the courtyard; the result is practically that of an open air group of class rooms. Another notable example in this field is that accomplished by E. F. Guilbert in the McKinley School at Newark, N. J. This is designed in stucco with decorative motives in tapestry brick and colored tile, following in general the manner of the Italian Renaissance. The building constitutes more of a cheerful neighborhood centre, than simply a school of text-book instruction. Several of the rooms are of the open air type and a large play court is provided at street level. The solution of the problem involved, in view of the irregularity of the site, is without question very creditable. Brick is still largely favored in the East and Middle West, while stucco naturally predominates in the Far West. Good brick examples of notable design are: the Trenton School of Industrial Arts, by Cass Gilbert, in which tapestry brick and tile appear; the Regis High School, New York, by Maginnis & Walsh, a monumental Italian Renaissance building; the brick and half-timber Donners Grove Kindergarten at Donners Grove, Ill., by Perkins, Fellows & Hamilton, undoubtedly one of the best designed examples in several years; the collegiate Gothic St. Ignatius's Loyola Day Nursery, New York, by W. Weissenberger, Jr.; the South Side High School, Newark, N. J., by E. F. Guilbert; the Fresno Normal School, Fresno, Cal., by the Architectural Division of the California State Department of Engineering; the grouped scheme of three buildings in the Edward Devotion School, Brookline, Mass., by Kilham & Hopkins; the Crookston High School, Crookston, Minn., by Bert D. Keck; the Dickerman School, Boston, Mass., by J. R. Schweinfurth; the dining hall of the Hill School, Pottstown, Pa., by Hewitt & Bottomley. Other examples are: the Walker School, Concord, N. H., by H. Templeton Blanchard; the Addison School, Cleveland, Ohio, by F. S. Barnum & W. R. McCormack; a parochial school at Holyoke, Mass., by John William Donohue; the South Park High School, Buffalo, N. Y., by Green & Wicks; the Norwood High School, Norwood, Ohio, by Ban-smith & Drainée; a public school building at Riverton, N. J., by Heacock & Hokanson; the High School of Commerce, Springfield, Mass., by Kirkham & Parlett; and the Hebrew Institute, Chicago, by Ottenheimer, Stern & Reichert, a structure entirely of concrete, the design suggesting certain German work, and achieving a decidedly interesting result.

UNIVERSITIES. The year does not offer any remarkable examples of planning, such as the various general group schemes adopted during 1914 among the important universities of the country. Times of financial stress are apt, among their first effects, to reduce benefactions to institutions, and when the slow work of restoration of equilibrium gathers strength it shows its effects in turn upon the dwellings and business buildings and only secondarily in institutional structures. A few notable single buildings are to be put down to the credit of 1915, however, such as the Evans Museum and Dental Institute at the University of Pennsylvania, Philadelphia, by John T. Windrim; Prudence Risley Hall, in the collegiate Gothic manner, by Miller & Mallory, at Cornell University, Ithaca; the excellent Gothic work of Allen &

Collens in Taylor Hall, at Vassar College, Poughkeepsie, N. Y.; Gilman Hall and other buildings on the new site of Johns Hopkins University, by Parker, Thomas & Rice, and by Joseph Evans & Sperry; Green Hall Auditorium, at Smith College, Northampton, Mass., by Charles A. Rich; an art building for Oberlin College, by Cass Gilbert; a men's gymnasium for Dartmouth College, Hanover, N. H., by Charles A. Rich, and a similar building at Leland Stanford Junior University, Palo Alto, Cal., by Bakewell & Brown; an infirmary for Haverford College, at Haverford, Pa., by Baily & Bassett; and a large concrete stadium for the College of the City of New York, by A. W. Brunner. With these should also be included the Nelson Morris Memorial Institute for Medical Research, Chicago, by Richard E. Schmidt, Garden & Martin.

HOSPITALS. In the field of hospital construction it is interesting to note that the last five years witnessed the greatest contribution in the way of bequests and direct donations that has ever accrued to any single type of building. The six most important examples, of which four are also teaching hospitals, are the following: that at the University of California, Berkeley, Cal., \$615,000; the Isaac L. Rice Hospital, New York (not yet begun), \$1,000,000; the New Haven Hospital, used by the Yale Medical School, New Haven, Conn., \$1,500,000; the Burke Convalescent Hospital, White Plains, N. Y., \$5,000,000; the Peter Bent Brigham Hospital, connected with Harvard University, Boston, Mass., \$7,000,000; and the large project to be undertaken by the Presbyterian Hospital of New York and Columbia University upon a new site in upper Manhattan, \$8,500,000. In this connection the following well planned buildings and groups should also be noted: the Cincinnati General Hospital, by Samuel Hannaford & Sons; the Jewish Maternity Hospital, Philadelphia, by Hewitt, Granger & Paish; the Abington Memorial Hospital, Abington, Pa., by Bissell, Sinkler & Tilden; the Central Dispensary and Emergency Hospital, Washington, D. C., by Nathan C. Wyeth; the Highland Private Hospital, Fall River, Mass., by Parker M. Hooper.

PUBLIC BUILDINGS. Among the Federal structures erected during the year, the most important were the Post Office and Court House at Denver, Colo., by Tracy, Swartwout & Litchfield; the United States Treasury Building, San Francisco, by J. Milton Dyer; the Post Office, Washington, by Graham, Burnham & Company; the Post Office, New Orleans, La., by James Gamble Rogers; the fine arcaded Florentine design of the Post Office at Berkeley, Cal., by William Arthur Newman & Oscar Wenderoth; and the additions to the Custom House at Boston, by Peabody & Stearns. In the last named the old building was made a base for a tall office tower, erected over an earlier dome. The fine Senate and House of Representatives Office Buildings were also occupied during the year, and the Department of Agriculture completed the Bieber Building from designs by MacNeil & MacNeil. All of these edifices are in the Capital city. Among the other public buildings, municipal and others, erected during the year are to be mentioned: the Hamilton County Court House, Cincinnati, Ohio., a \$2,500,000 structure by Parker, Kellogg & Crane; the armory of the Eighth Coast Artillery, New York, by

Pilcher & Tachau; a fine Municipal Building for Waterbury, Conn., by Cass Gilbert; a City Hall for Burlingame, Cal., by Chas. P. Weeks; the Town Hall of Bourne, Mass., by James Purdon; the remodeling of the Delaware County Court House, Media, Pa., by Brozer & Robb; an annex to the Boston City Hall, by E. T. P. Graham. Two well conceived bath houses should be included in this list: the Fordyce Bath House, Hot Springs, Ark., by George R. Mann & Eugene J. Stern, and the South Side Bath House, Pittsburgh, Pa., by MacClure & Spahr. One of the very good buildings of the year is undoubtedly the great Auditorium which forms the permanent building left as a monumental record of the Panama-Pacific International Exposition. This edifice will seat 12,000 persons, and was erected at a cost of \$1,000,000. It is located in San Francisco's new Civic Centre, some distance from the Exposition Grounds.

LIBRARIES. The year's best library buildings were that erected in Denver, Colo., by Ackerman & Rose and the Widener Memorial Library, by Horace Trumbauer, at Harvard University, Cambridge, Mass. The latter is one of the notable buildings of 1915 and has at once taken its place among the foremost library buildings of the country. At Bar Harbor, Me., the Morris K. Jesup Memorial Library was built from designs by Delano & Aldrich; Beverly, Mass., built a public library building from designs by Cass Gilbert; while D. Knickerbacker Boyd designed the Southwark Branch of the Philadelphia Public Library. Other examples of note are the Harrisburg, Pa., Public Library, by E. S. Child, and the Warren Library, Chicago, by Wm. E. & Arthur A. Fisher.

BANKS. The policy of locating banking firms in large office buildings continues in favor; in this field 1915 exceeds 1914 by about 30 per cent in the number of buildings erected. Cases in point are the Boatmen's Bank at St. Louis, Mo., by Eames & Young; the Citizen's National Bank, Los Angeles, Cal., by John Parkinson & Edwin Bergstrom; the First National Bank of Pueblo, Col., by R. E. Schmidt, Garden & Martin; the Murchison National Bank, Wilmington, N. C., by K. M. Murchison; the Holston National Bank, Knoxville, Tenn., by John Kevan Peebles; the Hartford National Bank, Hartford, Conn., by Donn Barber; the Brooklyn Trust Company, New York, by York & Sawyer. Smaller banking buildings of the year were the Corn Exchange Bank's Bronx and Eighty-sixth Street Branches, New York, by H. T. Lindeberg; the Stockton, Cal., Savings Bank, by Charles W. Dickey; the Far Rockaway National Bank, New York, by Jos. L. Steinam; the Amsterdam Savings Bank, Amsterdam, N. Y., by M. T. Reynolds; the First National Bank, Champaign, Ill., by Mundie & Jensen; the First National Bank, Allegheny, Pa., by F. J. Osterling.

HOTELS. The great era of hotel building of the year 1914 has been succeeded by a decided falling off in the number of new hotels, although no reduction is noticeable in the sumptuousness of the larger examples contributed by 1915. The finest of the year was the William Penn Hotel, Pittsburgh, Pa., by Janssen & Abbott, a 20-story structure containing 900 rooms; the enormous Hotel Traymore at Atlantic City, N. J., by Price & McLanahan; the well-designed Hotel Muhlbach, Kansas City, Mo., by Holabird & Roche; the Hotel Morrison, Chicago, by Mar-

shall & Fox, with 1600 bedrooms; the attractive Hotel Pantlind, Grand Rapids, Mich., by Warren & Wetmore; the brick and terra cotta Adelphia Hotel, Philadelphia, by Horace Trumbauer. Other less important examples were: the Hotel Allerton, New York, by Paul C. Hunter; the Capitol Park Hotel, Washington, D. C., by A. B. Mullett & Co., the Gothic Hotel Fontenelle at Omaha, Neb., by Thomas R. Kimball; the Hotel Black Hawk at Davenport, Ia., by Temple & Burrows, and the Hotel Brunswick at Lancaster, Pa., by C. Emlen Unbau, involving the use of a hot-water heating system in an eight-story building.

STORES. No important work was accomplished in this field during the year just closed. The largest buildings of the type to be erected were probably the May Store, Cleveland, by Graham, Burnham & Company, and the Ames Store in the same city, by Starrett & VanVleck. The severe Arnold Constable Store, New York, by T. J. Bartley, should also be mentioned. What may be the beginning of a new departure in New York City architecture is seen in the Standard Arcade, by Severance & VanAlen. Two very good public markets may be properly classed here, the Astor Public Market, New York, by Tracy & Swartwout, and the Worcester, Mass., Public Market, by O. C. S. Zirolli, both of well studied design.

OFFICE BUILDINGS. The largest office building of 1915 was the Equitable Building, New York, by E. R. Graham. This is the largest structure of its kind in existence, covering 48,000 square feet of ground, measuring 545 feet in height, rising to 45 stories above the street, and requiring foundations 85 feet in depth. Other large examples are: the Merritt Building, Los Angeles, Cal., by Reid Brothers; the terra cotta Goelet Building, New York, by Warren & Wetmore; the Hasco Building, New York, by Walter Haefeli; the Victoria Building, New York, by Schwartz & Gross; the Federal Realty Building, Oakland, Cal., a devious Gilbert inspiration, by B. G. McDougall; the Gothic building of the Delaware and Hudson Company, Albany, N. Y., by Marcus T. Reynolds; the Hurt Building, Atlanta, Ga., by J. E. R. Carpenter; the Balboa Building, San Francisco, Cal., by Bliss & Faville. The Russell Sage Building, New York, by Grosvenor Atterbury is the most attractive single example from the standpoint of design. The only newspaper buildings erected during the year were the *Farm Journal* Building, Philadelphia, by Bunting & Slougle; the *News Press* Building, St. Joseph, Mo., by Eckel & Aldrich; and the Circle Building, New York, by J. C. Greene. The last named is to be the home of the Hearst papers in New York. Only two stories have been completed to date; a huge tower will ultimately surmount the long low main body of the building. Other good examples of office buildings, without the skyscraper element, are: the Parkway Exchange of the Bell Telephone Company, Philadelphia, by John T. Windrim; the Widener Building, Philadelphia, by Horace Trumbauer; the Hallenbeck-Hungerford Building, New York, by William E. Austin.

FACTORIES, WAREHOUSES. Owing usually to their lack of architectural merit, factories and warehouses are rarely heralded in the architectural press; the same holds true to a great extent of the loft building type of factory, which resembles the office building in construction and

often is of similar design. A few of the more interesting examples contributed by the year may be mentioned, however: namely the bakery of Montgomery, Ward & Company at Kansas City, Mo., by J. W. McKecknie; the building of the Frank P. Lewis Cigar Company, at Peoria, Ill., by Hewitt & Emerson; the Kuppenheimer clothing factory, by S. N. Crowen, and the Burke & James factory, by Hill & Woltersdorff, both in Chicago; and the Thompson Malted Food Company Building, Waukesha, Wis., by Henry C. Hengels. Of the warehouses we may mention the Larkin Warehouse at Philadelphia, by Ballinger & Perrot, and the Wenter & Drechsler Warehouse at Oak Park, Ill., by Geo. S. Kingsley. In this connection is also to be noted the \$5,000,000 factory terminal begun by the Hoboken Land and Improvement Company at Hoboken, N. J., comprising six 12-story manufacturing lofts.

CLUBS, ETC. Among the year's club and society buildings the largest single group is again that of the secret orders. Thus we find new Elks' Club homes erected in Mankato, Minn. from designs by Bell, Tyrie & Chapman; at Pasadena, Cal., by Myron Hunt; and at Brooklyn, N. Y., by H. VanBuren Magonigle & A. W. Ross, the last named a fine building in the style of the Italian Gothic to Renaissance transition. An Odd Fellows' Hall was built at Oakland, Cal., by J. Henry Boehrer, another Masonic Building at Camden, N. J., by Heacock & Hokanson. The only pretentious athletic club of the year was the new building of the Detroit Athletic Club, a well designed and well appointed building, by Albert Kahn & Ernest Willy. The only Christian Association building was the Y. W. C. A. branch at Newark, N. J., by George B. Post & Sons. Among the social clubs are to be noted: the Suburban Club at Stamford, Conn., a Georgian brick structure, by Frederick B. Stearns & George F. Shepard; the Golf Club House at Dedham, Mass., by Melville Seth-Ward; the Knickerbocker Country Club, Tenafly, N. J., by Aymar Embury II. Various collegiate club buildings were also erected as follows: the Harvard Club addition, New York, by McKim, Mead & White; the Phi Gamma Delta Fraternity House, Philadelphia, Pa., by Mellor & Meigs; the "Michigan Union" Building, Ann Arbor, Mich., a very successful modernized Gothic design, by Pond & Pond; and the University Club, San Francisco, Cal., a good brick design modeled after the suggestions of the Italian Renaissance palace, by Bliss & Faville. Buildings were likewise erected by the following organizations of various purposes: the Musicians' Mutual Relief Society Building, Boston, Mass., by Maher & Winchester; the City Club, Boston, Mass., by Newhall & Blevins; the T Square Club, Philadelphia, by Wilson Eyre & McIlvaine; the Three Arts Club, Chicago, an original brick design, by Holabird & Roche; the Church Club House, St. Paul, Minn., by Frederick H. Brooke; and the stately Congressional Club, at the National Capital, by G. O. Totten.

APARTMENTS. It is of little avail to chronicle a large number of apartment house designs, for these offer but little of interest in the majority of cases. Certain stereotyped solutions appear again and again, and architects seem not yet to have mastered fully the general problem of this type of building. Much may be expected in this field, however, in the near future, for the

larger city populations are becoming more and more accustomed to the inconveniences of "living in layers," and the numerous space-saving devices and time-savers invented by eager exponents of present-day rush, not to mention the reduction in running expenses and responsibility offered by the apartment house, have rendered this mode of life increasingly attractive. Little of this kind of material finds its way into the periodicals, owing to the small scale at which illustrations must be shown to give the full height of the buildings, and owing also to the general paucity of good designs. We might record, among others, the Craig Apartments, Chicago, by Richard E. Schmidt, Garden & Martin; the Brown Apartments, Portland, Ore., by Clausen & Claussen; a number of examples in Chicago and New York, by Rouse & Goldstone, Cross & Cross, Louis Bouchard, and others. The rapidly growing districts of apartment houses in the West End Avenue and Park Avenue sections of New York offer a fairly close index of progress in this field. In this connection should also be mentioned the increasing number of model tenements, such as those recently erected in Avenue A, New York, providing sanitary, safe, and attractive small homes at a minimum rental. Thus a recent example offers in one building 60 two-room suites, 118 three-room suites, and 12 four-room suites, a total of 190 apartments, with a maximum rental of \$1.80 per room per week, leases being made by the week. Record must also be made of the fine solution by Schenck & Mead, of the housing problem involved in the clearing of Washington's alleys; a piece of work made possible by the Alleys Bill passed after the death of Mrs. Wilson. This project has been called the Ellen Wilson Memorial Homes, and was fostered by the District of Columbia Section of the Women's Department of the National Civic Federation. The homes will comprise 130 houses, offering accommodations for 250 families or 1000 persons.

RESIDENCES. The rapid progress of domestic architecture has been seriously hampered by money stringency resulting from European conditions, chiefly because funds have been diverted temporarily to more directly lucrative channels. War conditions have likewise imposed added difficulties upon the small house builder, and for some months the residential work is restricted to larger dwellings. As the year draws to a close profits from the manufacture of munitions and from allied sources have become available and a gradually increasing number of domestic buildings is reported, only to be hindered again by the high cost of building materials due to the causes indicated above. Among the dwellings erected in the Eastern States the following deserve mention: in Massachusetts, the Rantoul Residence at Ipswich, by Andrews, Jaques & Rantoul; the Rogers Residence at Newton Centre, by Oscar A. Thayer; in Connecticut, the Marble Residence at Greenwich, by Rowe & Smith; the VanShaack Residence, by A. Raymond Ellis; and the Allen Residence, by E. T. Hapgood, both at Hartford; the Leigh Residence at Bridgeport, by Ernest G. Southey; the Houghtaling Residence at Sharon, by Mann & MacNeille; in Rhode Island, the Duncan Residence at Newport, probably the most pretentious mansion of the year, by John Russell Pope; in New Jersey, the Hughes Residence at Plainfield, by Wilder & White; the Miller Residence, Newark, by Jordan Green; the Fowler

Residence at Peapack, by Hewitt & Bottomley; in New York, a city house on Manhattan, by W. W. Bosworth; the Phillips Residence at Tuckahoe, by John H. Phillips, an Italian villa adaptation; the important Lewisohn Residence at Ardsley, by Coulter & Westhoff; the Winthrop Residence, Syosset, L. I., by Delano & Aldrich; the Weld Residence, Huntington, L. I., by C. A. Platt; the Billings Residence at Locust Valley, L. I., by Guy Lowell; the Delano Residence at Syosset, L. I., by Delano & Aldrich; the Von Stade Residence at Westbury, L. I., by Cross & Cross. The best work of the year in Pennsylvania includes the following, many of which show the old Dutch Colonial tradition fittingly adapted to modern needs: the Saunders Residence at Germantown, by Duhring, Okie & Ziegler; the Harper Residence at Chestnut Hill, by McGoodwin & Hawley; "Tredinnock" at Ashbourne, by Lawrence Visscher Boyd; the Walton Residence at St. David's, by D. Knickerbacker Boyd; the Harris Residence, by Duhring, Okie & Ziegler, and the Lloyd Residence, by Bailly & Bassett, both in Villa Nova; the Moore Residence at Elkins Park, by Heacock & Hokanson; the Walker Residence at South Bethlehem, by Wilder & White; the large Tudor scheme of the two Glatfelter Residences at Spring Grove, by J. A. Dempwolf; the Ellis Residence at Bryn Mawr, by Wilson Eyre & McIlvaine. At Washington, D. C., was erected the French Renaissance design of G. O. Totten for the Moran Residence, and also the Parmelee Residence, by C. A. Platt; at Greensboro, N. C., the well scaled Colonial Brooks Residence, by A. Raymond Ellis; and at Annapolis the Labrot Residence, by Parker, Thomas & Rice. In the Middle West variety controls design and the whole gamut of stylistic possibilities is repeatedly tried. In Illinois were built, among others, the Paxter Residence at Lake Forest, by Richard Schmidt, Garden & Martin; the Riley Residence at Evanston, by Perkins, Fellowes & Hamilton; and at Chicago the Stevenson Residence, by George W. Maher, and the severe Italian Renaissance Blair Residence, by McKim, Mead & White. In Michigan: the Newbury Residence, by Trowbridge & Ackerman, the Speck Residence, by Albert H. Spahr, and the McMillan Residence, by Albert Kahn, all at Grosse Pointe; the Stevens Residence at Detroit, by George D. Mason & Albert C. MacDonald. From Louisville, Ky., was reported the attractive Allis Residence, by Lewis Coit Albro, and from Cleveland, Ohio, the Drury Residence, by Frank B. Meade & James M. Hamilton. Of the Western examples by far the greater number were again built in California, frequently using the Mission type of design, now destined to still greater popularity because of the success of the San Diego Exposition groups. To the fine residential district of Pasadena were added: the Harper Residence, by Reg. D. Johnson; the McWilliams Residence, by the same architect; and the Burnes Residence, by Myron Hunt & Elmer Grey. At San Diego was built the Putnam Residence, by Bristow & Lyman; at San Francisco the Ehrman Residence, by Willis Polk & Company; and in the rapidly growing residential town of Hollywood, a suburb of Los Angeles, the following: the Engstrom Residence, by F. A. Brown, of the *chalet* type, not by any means connoting the type of the same name on Swiss soil; the Russell Residence, by Elmer Grey; and "Yama Shiro," a highly attractive

Japanese villa scheme, standing on a knoll and approached by completely circular terraces, designed by Franklin M. Small. In Los Angeles proper were built the Denker Residence and the Sharp Residence, both by C. Cooper Corbett. In Texas, B. P. Briscoe designed the Garrow Residence at Houston, and in Denver, Col., were erected the Webster Residence and the Ross Residence, both by W. E. & A. A. Fisher.

MISCELLANEOUS. The chief railroad stations of the year, including also a few months of 1914, were: the N. Y. C. & H. R. R. stations at White Plains, N. Y., a brick building, by Warren & Wetmore, and at Hartsdale, N. Y., a brick and half-timber structure by the same firm; the Lehigh Valley R. R. station at Buffalo, by K. M. Murchison; the Pennsylvania R. R. station at Johnstown, Pa., by the same designer; the Santa Fé Station at San Diego, Cal., by Bakewell & Brown.

But few new theatres are recorded; the following may be mentioned: the Toy Theatre, Boston, Mass., a Georgian brick design, by Putnam & Cox; the Orpheum Theatre, Kansas City, Mo., by G. Albert Lansburgh; the Keeney Theatre, Brooklyn, N. Y., by Wm. E. Lehman.

Among the year's monuments should be noted: the excellent Spencer Trask Memorial, Saratoga, N. Y., by Henry Bacon and D. C. French; the Joseph Pulitzer Fountain, New York City, by Carrère & Hastings; the Arlington Amphitheatre, Washington, D. C., by the same firm; the Valley Forge Memorial, at Valley Forge, Pa., by Paul P. Cret; the Soldiers' Memorial at Westville, Conn., by Brown & VanBuren; the Eddy Monument, Mount Auburn Cemetery, N. Y., by Egerton Swartwout.

The only museum completed within the year was the Robert Dawson Evans Gallery, an extension of the Boston Museum.

EUROPE

GREAT BRITAIN. The following buildings of note were completed in England during the last 12 months. *Churches.*—All Saints' Church, Goodmayes, by P. K. Allen; St. Barnabas's Church, Mitcham, by H. P. Burke Downing; Our Lady and St. Casimir, London, by P. A. Lamb; Baptist Memorial Church, Twickenham, by Ingall, Bridgewater & Porter; St. Michael's and All Angels' Church, Beaconsfield, by G. H. Fellowes Prynne; St. Cuthbert's Church, Portsmouth, by E. Stanley Hall; Second Church of Christ Scientist, London, by John J. Burnet; Catholic Church, Northfleet, by G. Gilbert Scott; St. Michael and St. George's, Heswell, by Richard Beckett; St. Margaret's Church, Ilford, by Edwin T. Dunn; Liverpool Cathedral, a conscientious piece of stonework, designed by G. Gilbert Scott; St. Anselm's Church, Kennington, by Adshead & Ramsey, an easily recognized inspiration from Santa Maria della Grazie, Milan. *Schools.*—Lord Digby's School, Sherborne, by Edward C. H. Maidman; Wiggiston Grammar School, Leicester, by Howard S. Thomson; St. John's School, London, by A. H. Ryan Tenison; Bromsgrove School additions, Worcestershire, by Arthur Bartlett. *Universities, etc.*—The Liverpool University School of Architecture, by Professor Reiley; Rutherford College for Girls, Rutherford, by Marshall & Tweed; Lord Wandsworth's Institution for Agricultural Education, by E. Guy Dawber; St. Hugh's College, Oxford, by Buckland, Haywood & Farmer. *Hospitals.*—

The King Edward VII Memorial East Sussex Hospital, Hastings, by John Saxon Snell & Stanley M. Spoor; Royal Infirmary, Bristol, by H. Percy Adams & Charles H. Holden; Tuberculosis Dispensary, Sheffield, by F. E. P. Edwards. *Public Buildings*.—Metropolitan Water Board Offices, London, by H. Austen Hall; Government Buildings, Cardiff, by Richard J. Allison; Municipal Buildings, Stepney, by Nicol & Nicol; Board of Trade Offices, London, the largest single project of the year, the building of which has but recently been begun, by Vincent Harris; Municipal Buildings, Devonport, by Wilkinson & Binning; Police Buildings, Stockport, by Halliday & Paterson; British Colonial Government Building, London, by Alfred Burr. *Libraries*.—Carnegie Library, Diosbury, N. Manchester, by Henry Price. *Office Buildings*.—Westminster House for the American Tobacco Company, London, by Gordon & Gunton; Canada House, London, by Trehearne & Norman; British Dominion General Insurance Company's offices, London, by Arthur H. Moore; Premier Buildings, Liverpool, by G. deC. Fraser; Prudential Insurance Company's offices, Leicester, by Paul Waterhouse; Pearl Life Insurance Company's Building, London, by H. Percy Monckton; Alliance Assurance Company's offices, Sheffield, by Goddard & Catlaw; Cunard Building, Liverpool, by Willink & Thicknesse. *Banks*.—Capital and Counties Bank, St. Albans, by E. Brantwood Maufe; Royal Exchange, Manchester, additions by Bradshaw, Gass & Hope. *Residences*.—Brantham Court, Suffolk, by W. Harold Hillyer; "Monckton Croft," Alverstoke, by Wm. Acworth; "Great Roke," Witley, by M. T. Buckland & E. Haywood-Farmer; "Old Cleve," Lewes, by Rowland H. Halls; "Cariad," Goring-on-Thames, by W. T. Walker; "Islet," Maidenhead, by Ernest Flint; "North Lodge," Putney, by Williams & Cox; "Pembury Ridge," Pembury, by W. Henry White; "Overway," Tilford, by Henry M. Fletcher; "Beneffrey," Pollokshields, N. Glasgow, by Wm. Hunter McNab. *Homes*.—Edith Cavell Home for Nurses, London, by Rowland, Plumble & Partners. *Theatres*.—Carlton Theatre, London, by Charles T. Ruthen; Concert Hall, Worthing, by Peter D. Stonham. *Museums*.—Shipley Art Gallery, Gateshead, by Arthur Stockwell; Belfast Art Gallery, Belfast, by Geoffrey Lucas & Arthur Lodge. *Memorials, Monuments, etc.*—Lifford Memorial Hall, Broadway, by Andrew N. Prentice; Welsh National War Memorial, Cardiff, by Albert Toft; Margaret MacDonald Memorial, London, by Richard R. Goulden. *Miscellaneous*.—Wesleyan Hall, Stoke-on-Trent, by Reg. T. Longden; Institute of Marine Engineers, London, by Victor Wilkins; General Medical Council Meeting Hall, London, by Eustace C. Frere; Coburg Court Hotel, London, by Delissa Joseph; Regent's Park Restaurant, London, by John Belcher & J. J. Joass; Y. M. C. A. Building, Edinburgh, by G. Washington Brown. From other parts of the British Empire the following were reported: *Canada*.—Manitoba Parliament Buildings, a formal and uninteresting work, with Greek detail, by Frank W. Simon; Union Station, Quebec, by H. E. Prindle; Bancroft School, Montreal, by Nobbs & Hyde; First Church of Christ Scientist, Toronto, by S. S. Beman; St. Faith's Church, Edmonton, by Thomas G. Jackson; St. Michael's Church, Montreal, by Beaugrand-Champagne & Chenevert; Provincial Law Courts, Winnipeg, by Strachan; Bakery, Mon-

treau, by Sydney Comber; Rumely Products Company Building, Saskatoon, by Hill & Woltersdorf; Walker House, Ontario, by Burrows & Welles; Registry Office Building, Toronto, by C. S. Cobb; Fire Station and Recorder's Court, Maisonneuve, by Marius Dufresne; Putnam County Court House, Ottawa, by Frank L. Packard & Ralph Snyder; Dominion Express Building, Montreal, by Edward & W. S. Maxwell; Dominion Bank, Toronto, by Darling & Pearson; Police Headquarters, Calgary, by Lang & Major; Public Library, Regina, by Storey & VanEgmond; Knox College, Toronto, by Chapman & Griffin; University of Alberta, Edmonton, by Nobbs & Hyde. *India*.—Central Telegraph Office, and School of Tropical Medicine, Calcutta, by Henry A. Crouch; new Municipal Building, Karachi, by James Cumming Wynne; Cathedral of Colombo, Ceylon, by G. H. Fellowes Prynn. *Africa*.—Nairobi Cathedral, by Temple Moore; Town Hall and Municipal Offices, Johannesburg, by Hawke & MacKinley; Cathedral of Khartoum, Sudan, by Robert Schultz Weir.

CONTINENTAL EUROPE. From France and from Spain, and the invaded territories nothing whatever was reported. There was much discussion concerning the rebuilding of Belgium, this growing more animated with each recurring rumor of a possible peace at an early date. One of the most remarkable instances of economic self-sufficiency is that of Germany, which continues to build on an extensive scale, though its buildings are chiefly public, such as schools, hospitals, and homes; there are but few residences; nothing at all is done in the way of libraries, clubs, hotels, theatres, and the like, while there is, on the other hand, an enormous increase in industrial buildings. But little of this material can be reported in these columns because received too late for inclusion, since English control of the seas delays all periodicals, the only source of such information. A similarly interesting example is that of England, which, however, owes the continuance of its building activity to the large percentage of technical workers still available at home, while in Germany such activity is carried on only by those not required in the ranks. It is obvious that a continuation of hostilities over 12 or 18 months longer will undoubtedly result in a stagnation in all fields but that of hospital construction.

ARCTIC EXPLORATION. See POLAR RESEARCH, Arctic.

ARGENTINA. A Federal republic of southern South America. The capital is Buenos Aires, co-extensive with the Federal district.

AREA AND POPULATION. Argentina, or the Argentine Republic, consists of 14 provinces, 10 territories, and the Federal district. Estimates of the area, even those published by the Argentine authorities, differ considerably. The estimate which at present seems most acceptable is 2,987,356 square kilometers (1,153,417 square miles); another is 2,952,551 square kilometers (1,139,980 square miles); while a recent planimetric calculation made at the University of La Plata shows an area of 2,789,462 square kilometers (1,077,011 square miles). The census of 1895 returned a population of 4,044,911, including an estimate of 30,000 Indians and 60,000 others not censused. Recent estimates of population are not reliable, but it is certain that the number of inhabitants has rapidly increased. One estimate for 1912 is about 7,468,000; of

this number the Federal district was credited with 1,360,400, and the provinces of Buenos Aires, Santa Fé, and Córdoba, 2,017,200, 915,100, and 641,000, respectively. An estimate for Dec. 31, 1913, is 7,988,383. The Federal district (Buenos Aires city) has an area of 18,584 hectares, or about 72 square miles; its population, June 1, 1914, is reported at 1,560,163, and, as estimated for Jan. 1, 1915, 1,584,106, Buenos Aires being the largest city of the Southern Hemisphere and the largest Latin city of the world after Paris. Estimated population of other Argentine cities: Rosario (Dec. 31, 1912), 219,677; Córdoba, (1914), 135,000; La Plata (Dec. 31, 1912), 106,382; Tucumán (1913), 78,695; Bahía Blanca, 72,706; Mendoza, 60,000; Santa Fé, 48,600.

For the period 1857-1913 the number of immigrants by sea is reported at 4,550,402; emigrants, 2,949,137. Of the immigrants, Italians numbered 2,247,760; Spaniards, 1,420,393; French, 211,608; Russians, 155,285; Syrians, etc., 130,937; Austro-Hungarians, 85,053; Germans, 59,688; British, 53,792. Immigrants and emigrants in 1912 are reported at 323,403 and 120,260 respectively; in 1913, 302,047 and 181,056. Of the immigrants, in 1913, 215,871 were males. Of the total immigrants in that year, there were 122,271 Spaniards, 114,252 Italians, 19,542 Syrians, etc., and 18,616 Russians. Immigrants in 1914 are reported to number 115,308 (of whom 75,945 males); Spaniards numbered 52,211, and Italians 35,946. Emigrants in 1914, 178,684. Marriages in 1912 and 1913, 51,582 and 53,556; births, 272,071 and 286,181; deaths, 120,480 and 122,109.

EDUCATION. About one-half of the population over six years of age is illiterate, but the diffusion of elementary education is increasing. Primary instruction is free, secular, and nominally compulsory between the ages of 6 and 14. Estimated population of school age in 1913, about 1,275,000, of whom 804,000 were in school attendance. In that year there were 7247 primary schools (5894 public, 1353 private), with 22,964 teachers and 746,725 pupils. For secondary education there are 30 national colleges (about 8800 students) and 38 private schools of the same grade (3200 students). There are 67 normal schools (about 6600 students) and various establishments for commercial, industrial, technical, and other special instruction. There are national universities at Buenos Aires, La Plata, and Córdoba, and provincial universities at Paraná, Santa Fé, and Tucumán; students number about 7500, of whom the majority are at the University of Buenos Aires. There is no state religion, but the Roman Catholic Church receives government support.

PRODUCTION. Of the total area of the republic, over seven-tenths is stated to be productive. Of the two great industries, agriculture and stock-raising, the former in recent years has progressed the more rapidly, encroaching upon the grazing lands and forcing the flocks and herds farther from the cities and towns. The extension of the cultivated area is reported as follows, in thousands of hectares:

	1900-1	1908-9	1912-13	1913-14	1914-15
Wheat	3,380	6,063	6,918	6,574	6,261
Corn	1,255	2,974	3,830	4,152	4,203
Linseed	607	1,534	1,733	1,779	1,723
Alfalfa	1,512	.....	5,955	.....	.....
Oats . . . .	.....	638	1,192	1,249	1,161
Barley . . . .	.....	61	108	169	.....

	1900-1	1908-9	1912-13	1913-14	1914-15
Rye		10	40	92	.....
Potatoes		48	112	119	.....
Sugar cane		71	94	107	.....
Vines		122	102	106	.....

Total, including other . 7,811 22,988

Yield in 1913-14 and 1914-15 respectively (some of the figures being subject to slight revision): Wheat, 31,000,000 and 45,800,000 metric quintals; corn, 66,840,000 and 85,916,450; linseed, 9,950,000 and 11,255,000; oats, 7,400,000 and 8,310,000; barley, 1,750,000 in 1913-14; rye, 850,000 and 460,000; potatoes, 10,350,000 in 1912-13; raw sugar, 1,472,490 in 1913-14, and 2,761,400 in 1914-15; wine, 5,000,050 hectolitres in 1912-13, and 5,144,262 in 1913-14.

According to the live stock census of May 1, 1908, horses numbered 7,531,376; cattle, 29,116,625; sheep, 67,211,754; swine, 1,403,591; mules, 465,037; asses, 285,088; goats, 3,945,986. Live stock according to the census of May 1, 1908, and an estimate of 1914: Horses, 7,531,376 and 9,700,000; mules, 465,037 and 580,000; asses, 285,088 and 340,000; cattle, 29,116,625 and 29,500,000; sheep, 67,211,754 and 80,000,000; goats, 3,945,986 and 4,500,000; swine, 1,403,591 and 3,050,000.

Various minerals occur, including petroleum, but mining has not become of any great importance. Much capital is invested in meat packing, etc., and flour milling shows a considerable development.

COMMERCE. Imports and exports of merchandise have been valued as follows, in thousands of pesos gold:

	1900	1905	1910	1912	1913	1914
Imports—						
113,485	205,154	351,771	384,853	421,353	271,818	
Exports—						
154,600	322,844	372,625	480,391	483,505	349,254	

As the table shows, there was a very great decline in trade in 1914; this was due both to domestic economic conditions and to the war. In the last three months of the year wheat exports were suspended. The total wheat export for the year amounted to about 960,000 metric tons, as compared with 2,812,149 tons in 1913. Other important exports in 1913 were as follows: Corn, 4,806,951 metric tons; linseed, 1,016,732; oats, 889,745; bran, 274,058; wheat flour, 124,649; barley, 40,742; live cattle, 224,911 head; sheep, 103,977 head; frozen beef, 332,054 metric tons; chilled beef, 34,175; frozen mutton, 45,928; wool, 120,080; sheepskins, 20,124; goat skins, 2441; cattle hides, 86,974. Values of the more important exports in 1912 and 1913, in thousands of pesos gold: Corn, 108,908 and 112,292; wheat, 97,835 and 102,631; linseed, 34,214 and 49,910; wool, 58,149 and 45,270; cattle hides, 42,129 and 38,532; frozen and chilled beef, 34,285 and 36,623; oats, 21,859 and 20,447; rendered tallow and grease, 11,315 and 9445; wheat flour, 6926 and 7224; cattle, 9140 and 6849; sheepskins, 7657 and 5848.

The larger classified imports in 1912 and 1913, in thousands of pesos gold: Textiles and manufactures thereof, 78,370 and 89,560; iron and steel and manufactures thereof, 45,998 and 50,040; vehicles and railway equipment, 32,799 and

37,223; earthenware, glass, stone, earth, coal, etc., 33,617 and 36,578; building materials, 31,265 and 35,776; food products, 30,140 and 34,934.

Trade by principal countries is shown below in thousands of American dollars:

	Imports		Exports	
	1913	1914	1913	1914
United Kingdom	126,960	89,700	116,757	99,085
Germany	69,172	88,796	56,178	29,809
United States	60,172	35,586	22,208	41,681
France	36,934	21,722	36,587	19,872
Total, including others	408,712	263,663	468,999	338,777

The following figures show the percentage of imports and exports as shared by the leading countries:

	Imports			Exports		
	1912	1913	1914	1912	1913	1914
United Kingdom	30.8	31.1	34.0	25.3	24.9	29.2
Germany	16.6	16.9	14.8	11.3	12.0	8.8
United States	15.4	14.7	13.4	6.7	4.7	12.3
France	9.8	9.0	8.2	7.5	7.8	5.7
Italy	8.5	8.3	...	4.4	4.1	...
Belgium	5.3	5.2	...	7.8	6.8	...
Brazil	2.5	2.2	...	4.7	5.0	...
For orders	...	...	...	23.9	24.4	23.7

The exports "for orders" are not recorded at the Argentine ports as for specific countries, but are subject to cable or other orders for final destination. Nearly all of these shipments reach the western European countries, in about the same proportion as the direct shipments given in the foregoing table. Therefore the percentage of Argentine exports assigned to such countries as the United States and Brazil is in reality too high.

Imports and exports of merchandise at the principal ports, in 1913, in thousands of pesos gold: Buenos Aires, 337,643 and 170,445; Rosario, 37,111 and 90,575; Bahía Blanca, 13,381 and 55,772; La Plata, 10,005 and 43,065.

For the first half of 1915, imports were valued at 100,127,910 pesos gold, showing a decrease of 41.4 per cent as compared with the imports of the first half of 1914; exports, 310,910,368 pesos gold, showing an increase of 45.4 per cent. The balance of trade in favor of the republic during this period was the highest ever reached.

COMMUNICATIONS. The length of railway reported in operation in 1914 is 21,880 miles, of which 3481 miles belong to the state.

Railway mileage in 1915 amounted to 22,826 miles. The state railways were increased by 200 miles during 1914, giving a total mileage of 3209, of which 2908 miles were narrow-gauge. In the course of 1914-15 the Buenos Aires Great Southern Railway opened 65 miles of additional line, making its total mileage 3792 miles. The Buenos Aires Western Company also completed 34 miles of line upon the Valentin Gómez extension; and a second section of 41 miles of the same extension was also completed with the exception of station and other buildings. In 1914 and 1915 the railways of Argentina suffered considerably from the effects of floods, as the rainfall was so great that rivers and ordinary channels could not carry it off and great lakes were formed. With high winds the flood water was raised into waves and in many parts the track was undermined and washed away, requiring

extraordinary measures for protection of the line, including piling with wood, laying sheets of galvanized iron where the banks were most exposed, filling in washouts with cement and broken brick in wire netting, and similar measures. The extra cost to the Buenos Aires Western Railroad was \$600,000. Similar work was required on the Buenos Aires Great Southern and Central Argentine Railways.

Telegraph lines (1914), 43,153 miles (of which, national telegraph lines, 18,709 miles), with 131,586 miles of wire. Wireless telegraph stations, 12. Post offices, 3312.

FINANCE. The monetary unit is the peso (gold), equivalent to about 96.47 cents. Under the conversion law of 1899, the paper peso is current with a value of 44 per cent of the gold peso, or 42.46 cents. The budget for 1915 fixed the expenditures at 381,320,745 pesos paper. The budget submitted to the Congress for 1916 placed the expenditures at 343,207,692 pesos paper. The larger estimated ordinary expenditures for 1916 are: Treasury, 16,314,546 pesos, and 88,738,069 pesos, the latter sum being for account of the public debt; justice and public instruction, 57,863,292; interior, 45,298,017; war, 25,064,635; marine, 21,207,118. About half the ordinary revenue is derived from import duties, estimated at 149,000,000 pesos paper for 1915.

The national debt at the end of 1913 stood at 466,659,909 pesos gold; in addition, paper money in circulation, 178,082,840 pesos. At the end of 1914 the debt was 468,413,557 pesos gold, with 174,113,440 pesos paper in circulation.

NAVY. Argentina has 2 dreadnoughts, the *Rivadavia* and the *Moreno*, both launched in 1911, the former at Quincy, Mass., and the latter at Camden, N. J.; each displaces 28,000 tons. Besides the 2 dreadnoughts the navy includes 2 old coast guards (1890 and 1891), aggregating 4600 tons; 1 old coast guard (1880), of 4200 tons; 4 armored cruisers (1896 to 1898), aggregating 27,400 tons; 3 protected cruisers (1890 to 1895), aggregating 11,620 tons; 2 old torpedo cruisers (1890 and 1893), 1776 tons; 2 armored river gunboats (1908), 2100 tons; 11 torpedo-boat destroyers, 9000 tons; torpedo boats, transports, etc.

GOVERNMENT. Argentina is a federal republic. The executive is vested in a President, who is elected for six years by indirect vote, and is ineligible for the next term; he is assisted by a responsible ministry of eight members. The legislative power devolves upon a Congress of two houses, the Senate and the Chamber of Deputies. Senators are 30 in number, elected indirectly for nine years, two from each province and the Federal district. Deputies, numbering 120, are elected for four years by popular vote. Roque Sáenz Peña, elected President for the term ending Oct. 12, 1916, died on Aug. 9, 1914, and was succeeded by the Vice-President, Victorino de la Plaza.

HISTORY

EFFECT OF THE WAR UPON ARGENTINA. Argentina suffered, as well as the other South American countries, from the effects of the war in Europe, but recovered more rapidly than the others. On January 2nd the republic floated a loan for \$15,000,000 in New York, Chicago, Boston, Pittsburgh, and Philadelphia. The notes were all taken up within a few hours by the

bankers of these cities. This was the first time that the United States had ever negotiated a direct loan to any South American country. With the aid of this loan Argentina was able to bolster her financial administration until it again reached its normal condition. In May the government made a second attempt to secure money by means of a loan. This time it decided to issue \$50,000,000 worth of Treasury warrants, half of which were to be sold in the United States and the other half in England. American financiers subscribed to their half of the loan in less than a week's time, but London bankers received the proposition with less enthusiasm and at the end of a week had subscribed to only 12 per cent of their share. This augured well for the formation of a closer relationship between Argentina and the United States than had been possible hitherto because of the dependence of Argentina on British financial backing.

THE "ABC" PEACE TREATY. Coincident with its celebration of the 105th anniversary of the formation of the republic Argentina, on May 25th, acted as host to the ministers of Brazil and Chile while the ABC treaty of peace was being signed. This was the first actual treaty between the three strongest powers of South America, although they had worked harmoniously together on several occasions when the interests of all demanded it. The treaty which was signed at Buenos Aires on May 25th by Señor Alejandro Lira of Chile, Dr. Lauro Muller of Brazil, and Señor José L. Murature of Argentina, provided for five years of peace between the three nations, during which time each of the three nations was pledged not to make war against either of the others until the causes of conflict had been investigated and reported upon by an impartial commission.

ARGENTINA AND THE UNITED STATES. Argentina acted in connection with the United States in attempting to bring about a reign of law and order in Mexico, and was one of the nations which recognized Carranza, after the latter had been selected as Provisional President of Mexico by the representatives of the seven American nations. Argentina likewise took part in the Pan-American Financial Congress in May, her delegates being Samuel Hale Pearson, one of Argentina's leading financiers, Richard C. Aldao, a prominent attorney, V. Villamil, and John E. Zimmerman, business men. All urged closer relations between Argentina and the United States. The establishment of a branch bank at Buenos Aires by the National City Bank of New York was thought by the delegates to be a splendid instrument in bringing about this relationship. President Wilson while attending a dinner, given in his honor by Ambassador Naón, on board the Argentine battleship *Moreno* in March, said:

"I want to congratulate you upon the completion of this ship and upon all that she stands for in the way of reciprocity between ourselves and the great country you represent, and I want to express my feeling as President of the United States that we are rapidly approaching a day when the Americans will draw together as they have never drawn together before, and that it will be a union, not of political ties, but of understanding and of mutual helpfulness."

CABINET CHANGES. In August, Minister of Finance Carbo and Minister of Justice Cullen resigned their portfolios, and were succeeded,

respectively, by Francisco Oliver and Carlos Saavedra.

ARIZONA. POPULATION. The estimated population of the State on July 1, 1915, was 247,299. It was 204,354 in 1910.

AGRICULTURE. The acreage, production, and value of the principal crops, as estimated by the United States Department of Agriculture in 1914-15, were as follows:

		Acreage	Prod. Bu.	Value
Corn	1915	20,000	600,000	\$690,000
	1914	18,000	576,000	691,000
Wheat	1915	39,000	1,092,000	1,256,000
	1914	31,000	868,000	1,085,000
Oats	1915	9,000	333,000	213,000
	1914	8,000	336,000	235,000
Barley	1915	35,000	1,295,000	725,000
	1914	35,000	1,260,000	756,000
Potatoes	1915	1,000	95,000	95,000
	1914	1,000	110,000	132,000
Hay	1915	147,000	a 470,000	4,512,000
	1914	142,000	454,000	3,995,000

a Tons.

MINERAL PRODUCTS. The value of the production of gold, silver, copper, lead, and zinc in 1914 was \$59,956,029, compared with \$70,875,027 in 1913, a decrease of \$10,918,998. The gold produced in the State in 1914 amounted to 202,167 ounces, valued at \$4,179,155, an increase of \$155,244; silver production increased from 3,948,091 ounces, valued at \$2,384,647, in 1913, to 4,377,994 ounces, valued at \$2,441,417, in 1914. The copper output from the ores of the State, chiefly from crude ores and concentrates, decreased from 407,923,402 pounds, valued at \$63,228,127, in 1913, to 393,017,400 pounds, valued at \$52,271,314, in 1914. In spite of this decrease, Arizona continued at the head of the list of copper producing States. The lead in Arizona ores in 1914, which were shipped to smelters outside the State, amounted to 15,003,068 pounds, valued at \$585,125, compared with 16,144,772 pounds in 1913. The spelter recovered from Arizona zinc ores in 1914 amounted to 9,792,337 pounds, valued at \$449,409, compared with an output of 9,928,067 pounds, valued at \$527,972, in 1913. There were during the year 395 producers engaged in the production of copper, gold, silver, lead, and zinc, compared with 380 in 1913. The production of gold from the mines of the State in 1914 was greater than that of any previous year. Lead ores yielded 494,226 ounces of silver in 1914. Of the total output of silver for the year, 3,286,267 ounces came from crude ore shipped to smelters, 423,892 ounces from concentrates shipped, and 617,049 ounces from mill bullion. The value of the State's total mineral production in 1914 was \$60,391,272 compared with \$71,429,705 in 1913. This represented a decrease of 15.5 per cent. Arizona ranked seventh in value in 1914.

FINANCE. At the beginning of the fiscal year 1914 there was in the treasury a balance of \$1,034,183. The receipts for the year amounted to \$2,770,571, and the disbursements to \$3,051,356, leaving a balance in the treasury of \$703,298. The bonded debt of the State, consisting wholly of bonds, of which the greater part was issued for funding purposes, amounted to \$3,500,000.

EDUCATION. The total school population in the State in 1915 was 56,471. The total enrollment in the public schools was 43,316, with an average daily attendance of 29,582. Teachers numbered 160 male and 1059 female. The total

school expenditure for the year was \$1,348,242.

CHARITIES AND CORRECTIONS. The charitable and correctional institutions of the State include a State Hospital for the Insane, State Prison, State Industrial School, and State Home for Aged and Infirm Pioneers. During the year the Legislature enacted a law giving city police courts concurrent jurisdiction with justices of the peace, also a law providing for the administration of relief to the amount of \$10,000 in Navajo County, and \$30,000 in Apache County, on account of floods due to the breaking of the reservoir. Since the operation of a State-wide prohibition law on the first of the year the number of arrests in city and county courts decreased considerably, and the population of the prisons declined from 565 in September, 1914, to 400 in September, 1915. An old age and mothers' pension law was passed by the Legislature, was taken to the courts, and was at the end of the year awaiting a hearing before the Supreme Court.

TRANSPORTATION. The railway mileage in the State on June 30, 1915, was 2989. Railways having the longest mileage are the Atchison, Topeka and Santa Fé, 1159; Southern Pacific, 682; Arizona Eastern, 448; and the El Paso and Southwestern, 349.

POLITICS AND GOVERNMENT. The Legislature met in 1915, but passed no measures of unusual importance. The United States Court in San Francisco, on January 7th, declared the anti-alien employment act adopted by the voters of the State in November, 1914, unconstitutional, as being in conflict with the 14th Amendment to the Constitution. The act provided that not more than 20 per cent of the employees of a firm should be aliens. A substitution bill, passed by the House of Representatives on February 9th, provided among other things that all persons engaged in hazardous occupations should be able to read and write English. This bill was defeated in the Senate. The anti-alien law was carried to the United States Supreme Court, but no decision had been rendered at the end of the year. A State-wide prohibition bill went into effect in the State on Jan. 1, 1916, as a result of the constitutional amendment adopted Nov. 3, 1914. The law was contested, and was upheld in all points by the State Supreme Court on February 13th.

STATE OFFICERS. Governor, George W. P. Hunt; Secretary of State, Sidney P. Osborn; Assistant Secretary, R. E. McGillen; Auditor, J. C. Callaghan; Treasurer, Mit Sims; Attorney-General, Wiley E. Jones; Superintendent of Public Instruction, C. O. Case; Adjutant-General, Charles W. Harris; Superintendent of Public Health, R. N. Looney—all Democrats.

SUPREME COURT. Chief Justice, Henry D. Ross; Associate Justices, Alfred Franklin, D. L. Cunningham; Clerk, C. F. Leonard.

STATE LEGISLATURE.

	Senate	House	Joint Ballot
Democrats	18	35	53
Republicans	1	0	1
Democratic majority..	17	35	52

ARIZONA, UNIVERSITY OF. A State university for higher education founded in 1885 at Tucson, Arizona. The students enrolled in the several departments in the autumn of 1915 were 400. The faculty numbered 52. There

were added during the year to the faculty D. H. H. Foster, head of the Department of Education; Dr. S. J. Frank, head of the Department of Law; Dr. H. M. Colvin, instructor in Law and Economics; Dr. H. M. Leonard, head of the Department of Mathematics. Dr. E. S. Bates, head of the Department of English, resigned. There were no noteworthy benefactions received during the year. The university is almost entirely supported by legislative appropriations. The receipts amount to about \$350,000 annually. The library contains about 22,359 volumes. The president is R. B. Von Kleiss Smid.

ARKANSAS. POPULATION. The estimated population of the State on July 1, 1915, was 1,713,102. The population in 1910 was 1,574,449.

AGRICULTURE. The acreage, production, and value of the principal crops as estimated by the United States Department of Agriculture in 1914-15 were as follows:

		Acreage	Prod. Bu.	Value
Corn	1915	2,700,000	62,100,000	\$39,744,000
	1914	2,400,000	42,000,000	33,600,000
Wheat	1915	220,000	2,750,000	2,778,000
	1914	125,000	1,625,000	1,609,000
Oats	1915	375,000	10,125,000	5,265,000
	1914	280,000	6,240,000	3,807,000
Rye	1915	1,000	10,000	10,000
	1914	1,000	10,000	10,000
Rice	1915	100,000,000	4,840,000	4,598,000
	1914	92,580,000	3,685,000	3,316,000
Potatoes ...	1915	28,000	2,520,000	3,022,000
	1914	25,000	1,500,000	3,315,000
Hay	1915	350,000	a 560,000	5,768,000
	1914	320,000	336,000	4,334,000
Tobacco ...	1915	500	b 300,000	51,000
	1914	700	427,000	77,000
Cotton	1915	2,150,000	c 785,000	43,590,000
	1914	2,480,000	1,016,000	32,084,000

a Tons. b Pounds. c Bales of 500 pounds gross weight.

MINERAL PRODUCTS. The coal production of the State in 1914 was 1,836,540 tons, valued at \$3,158,168. This is a decrease of 397,567 tons from the production of 1913. This is attributed to the falling off of the use of coal for manufacturing purposes, due to demoralization in the cotton industry, and to the decrease in the domestic consumption, because of mild weather during the winter of 1914. There were labor troubles during the year, and 1415 men, or about one-third of the total number employed, were on strike for one reason or another. There were during the year 11 fatal accidents in the coal mines of the State. The total value of the mineral products of the State in 1914 was \$5,785,199.

TRANSPORTATION. The total railway mileage in the State on June 30, 1914, was 5335.

FINANCE. The total receipts from Jan. 1, 1915, to Sept. 30, 1915, amounted to \$3,730,651. The disbursements for the same period amounted to \$3,711,340. There was a balance at the beginning of the fiscal year of \$234,744, and at the end of \$254,055. The chief source of revenue is direct taxation. The chief expenditures are for charitable institutions, agricultural schools, and the University of Arkansas. The bonded debt of the State was \$1,250,500.

EDUCATION. The total school population in the State on June 30, 1915, was 649,689. The enrollment in the public schools was 453,834, with an average daily attendance of 302,963. There were 10,832 teachers, who received an average annual salary of \$303.50. The total

expenditures for the support of schools was \$4,470,936.

CHARITIES AND CORRECTIONS. The charitable and correctional institutions of the State under the control of the State Board are the State Hospital for Nervous Diseases at Little Rock, Deaf Mute Institute at Little Rock, School for the Blind at Little Rock, the Confederate Soldiers' Home at Sweet Home, Arkansas State Penitentiary and State Farm, and the Arkansas State Reform School at Little Rock.

POLITICS AND GOVERNMENT. The Legislature met in 1915, and passed several measures of importance. The first of these related to the matter of liquor regulation. A State-wide prohibition bill known as the Newberry Bill passed the House of Representatives on February 1. This measure prohibits the sale or giving away of liquor after June 1, 1915. It made a violation of the law a felony, and provided for prison terms of not less than one year. The Senate adopted the bill with an amendment that it become effective on July 1, 1915. It was signed by Governor Hays. The Senate on February 1 passed a resolution referring a constitutional amendment providing for woman suffrage to popular vote. On account of the provision of the State Constitution which provides for the submission of not more than three proposed amendments to the Constitution at any election, it was necessary to defer the settlement of the question for two years.

STATE OFFICERS. Governor, George W. Hays; Secretary of State, Earle W. Hodges; Auditor, M. F. Dickenson; Treasurer, Rufus G. McDaniel; Attorney-General, Wallace Davis; Commissioner of State Lands, Highways, and Improvements, William B. Owen; Commissioner of Mines, Manufacture, and Agriculture, John H. Page; Superintendent of Public Instruction, George B. Cook.

SUPREME COURT. Chief Justice, E. A. McCulloch; Associate Justices, Carroll D. Wood, J. C. Hart, W. F. Kirby, and Frank Smith.

STATE LEGISLATURE.

	<i>Senate</i>	<i>House</i>	<i>Joint Ballot</i>
Democrats	35	97	132
Republicans	0	3	3
Democratic majority..	35	94	129

ARKANSAS, UNIVERSITY OF. A State institution for higher education established in 1872, at Fayetteville, Arkansas. There were in attendance in all departments in the autumn of 1915, 783 students. The faculty numbered 75. There were no notable changes in the faculty, and no noteworthy benefactions were received. The library contains about 25,000 volumes. The president is J. C. Futrall, M.A.

ARMENIAN CASE. See UNITED STATES AND THE WAR.

ARMIES. See MILITARY PROGRESS, and section *Army*, under the various countries.

ARMSTRONG, PAUL. American dramatist, died Aug. 30, 1915. He was born in Kidder, Mo., in 1869, and began life as a sailor on the Great Lakes, eventually becoming master of a steamer. Later he went to New York, and engaged in journalism. During this period he wrote his first play, *A Night in the Police Station*. His first success was *The Heir to the Hoorah*, produced in 1904. This was followed by *Salomy Jane* (1905) and by his greatest

success, *Alias Jimmy Valentine* (1909). He collaborated in *Via Wireless* (with Winchell Smith, 1909), *Going Some* (with Rex Beach, 1909), and *Deep Purple* (with Wilson Mizner, 1911). Nearly all Mr. Armstrong's plays met with unusual success.

ART. See ARCHITECTURE; MUSIC; and PAINTING AND SCULPTURE.

ART EXHIBITIONS. See PAINTING AND SCULPTURE.

ARTILLERY. See MILITARY PROGRESS, and section *Army*, under UNITED STATES, and under various foreign countries.

ASBESTOS. This has never been produced in large quantities in the United States. The annual production has ranged from 71 short tons in 1890 to 7604 in 1911. In 1914 there was an increase in the output of high grade crude fibre. The total amount of asbestos mined and sold in that year was 1247 short tons, valued at \$16,810, compared with 1100 valued at \$11,000 in 1913. Asbestos is produced practically in only two States, Georgia and Arizona, though small quantities are mined in California and Virginia. The largest production is from Georgia. Canada is the principal source of the world's supply of asbestos, and large quantities are imported into the United States. These, during the twelve months ending Dec. 31, 1914, amounted to 71,781 short tons, or more than 74 per cent of all the asbestos mined in Canada. The value of the manufactured and unmanufactured asbestos imported for consumption in the United States in 1914 was \$1,779,223.

ASIA. See ANTHROPOLOGY; EXPLORATION; and articles on the various Asiatic countries.

ASPHALT. Although there was a decrease in the marketed production of asphalt and of manufactured or oil asphalt derived from domestic sources in the United States in 1914, the decrease was more than offset by the greatly increased output of oil asphalt derived from crude petroleum imported from Mexico. The output of natural asphalt amounted to 77,588 short tons, valued at \$630,623; the output of oil asphalt from domestic petroleum amounted to 360,683 short tons, valued at \$3,016,969; and the output from American refineries of oil asphalt from Mexican petroleum amounted to 313,787 short tons, valued at \$4,131,153. In Texas and Utah the output of certain varieties of natural asphalt, required for special purposes, showed an increase. In California there was a notable increase of oil asphalt, derived wholly from domestic petroleum. During the calendar year 1914 asphaltic material and productions to the value of \$186,142 were imported. Exports during the same period were valued at \$1,247,020.

ASPHYXIATING GASES. See CHEMISTRY, INDUSTRIAL; and MILITARY PROGRESS.

ASQUITH, HERBERT HENRY. See GREAT BRITAIN, *History, passim*.

ASTRONOMY. During 1915 the American observatories maintained their usual high level of productivity in the field of astronomical research, but, owing to the European war, a marked decrease of activity on the part of the observatories of the Old World was evident. Further details concerning the ninth satellite of Jupiter, discovered by Prof. Seth B. Nicholson in 1914, were published, and this tiny celestial body is now firmly established as a

member of the Jovian family of satellites. The periodic comets discovered by Winnecke and Tempel in 1858 and 1873, respectively, reappeared, and three new comets were found. The death roll of the year included the names of Arthur Auwers, famous for his re-reduction of Bradley's observations and the compilation of star-catalogues; Lady Huggins, the able assistant of her distinguished husband, the late Sir William Huggins, in his epoch-making researches in astrophysics; G. F. Chambers, whose popular works on astronomy have been largely instrumental in spreading a general knowledge of the science; and Theodore Albrecht, chief of the International Bureau for the Investigation of Latitude Variation from its foundation in 1898.

MOUNT WILSON SOLAR OBSERVATORY. In his report of the work accomplished by himself and his assistants at this observatory during 1914, Prof. George E. Hale called attention to the fact that the opening of the second decade of the existence of the observatory was marked by a vigorous revival of solar activity after a prolonged period of calm. The first decade was remarkable for the amount of work accomplished and the new fields of inquiry in solar physics which were opened up. The skill of the director and his co-workers in devising new methods of research was unparalleled in the history of astronomical activity in this field, and it is not too much to say that, in quality, as well as quantity, of output, the observatory stood unrivaled among those devoted to the investigation of the physics of the sun. The methods which were developed and tested during the first decade became firmly established and gave promise of even greater and more important results for the future. The year 1914 was one of the most productive in the history of the observatory. The principal conclusions derived from the work of the year were summarized under 59 heads. Investigations were made of the general magnetic field of the sun, and of the magnetic fields of sun spots. In the case of the former, its existence was shown by 25 lines, representing the elements iron, chromium, vanadium, and nickel (with one unidentified), and all originating at comparatively low levels in the solar atmosphere. Attempts were made to observe the Stark effect due to electric fields in sun spots, but yielded no positive results. On "flash" spectra taken without an eclipse more than 1000 bright lines were measured, surpassing in number those photographed in the same region of the spectrum at eclipses and representing a lower level in the solar atmosphere. A preliminary study of the displacements of solar lines at the sun's centre gave no evidence of the gravitational shift toward the red predicted by Einstein, and the results also failed to support the anomalous dispersion theory advanced by Julius. From an investigation of the levels of the various elements in the sun's atmosphere, the conclusion was reached that the great mass of the vapors present is condensed in a very thin layer close to the photosphere.

The first determinations of stellar parallax with the 80-foot Cassegrain combination of the 60-inch reflector were completed and found very satisfactory. The enormous velocity in space of 577 kilometers per second was found in the

case of the star O. Arg. S. 14320. By the measurement of some 600 stars near the North Pole, there was established for stars from the second to the twentieth magnitude a photographic scale, which agrees closely with the Harvard scale for the middle interval but shows divergencies for both bright and faint stars. The disappearance of the chief nebular lines from the spectra of Nova Aurigæ and Nova Persei was observed; these spectra are now identical with those of certain Wolf-Rayet stars, and it is suggested that the latter may be temporary stars in the later stages of their history. Work on the 100-inch mirror was steadily maintained, an almost perfectly spherical figure being obtained, and preparations for its parabolization were made, including the completion of the 60-inch plane mirror for testing its figure.

POLARITY OF SUN SPOTS. When the magnetic polarity of sun spots was discovered at Mount Wilson in 1907, it was expected that the spot vortices in the northern and southern hemispheres of the sun would have opposite directions of rotation. This expectation was not immediately realized, for spots showing opposite directions of rotation were soon observed in each hemisphere. Professor Hale's discovery of bipolar spots in 1909, however, afforded a basis for a reconsideration of the whole question, and it was found that, if every spot were classified as the preceding or following member of a bipolar group, as a rule the preceding (or following) spots in opposite hemispheres showed opposite polarities. Later work at Mount Wilson on the polarity of sun spots brought out the interesting fact that, while in the new spot cycle just begun the rule of opposite polarity for the preceding (or following) spots in the two hemispheres still holds, the polarities in a given hemisphere are opposite to those observed in that hemisphere just before the recent spot minimum. Since, in accordance with the well-known law of sun spot distribution, the spots of a cycle appear at first in high solar latitudes and descend as the cycle progresses, it seems likely that the polarity is determined by the solar latitude, and it is suggested that the simplest explanation of the anomaly lies in assuming the existence of high and low latitude zones, distinguished by spots of opposite polarity. Future observations are expected to test this view, and also to reveal what happens in the intermediate zone.

SOLAR RADIATION CONSTANT. In spite of the extremely accordant values of the solar radiation constant obtained by Messrs. Abbot, Fowle, and Aldrich, of the Smithsonian Institution, from measurements made under diverse conditions of height above sea level, atmospheric transparency, temperature, etc., their results were severely criticized. It was urged by some that their allowance for the heat absorbed by the atmosphere was too low; by others it was claimed that the amount of solar radiation reflected from the outside of the atmosphere was underestimated, and that the true value of the constant should be at least 3, and perhaps as high as 4 calories per square centimeter per minute instead of 1.93 calories, the value deduced by the Smithsonian observers. This value was derived from nearly 1000 measurements made during the period 1903-1914 at

Washington (sea level), Bassour, Algeria (1160 meters), Mount Wilson, California (1730 meters), and Mount Whitney, California (4420 meters). In addition, a series of high-altitude observations, in which sounding balloons were used, was carried out by the Smithsonian Institution in cooperation with the United States Weather Bureau during the summers of 1913 and 1914. On July 14, 1914, a *ballon sonde* carrying a recording pyrheliometer was released at Omaha, and reached a height of 24,000 meters, or nearly 15 miles. The mean value of the solar radiation constant deduced from the best three records made on this occasion was 1.84 calories, or, when corrected for the radiation scattered and absorbed in the atmosphere above the level attained, 1.88 calories, a value which accords satisfactorily with the value previously obtained.

MARS. Spectrograms were obtained at the Lowell Observatory showing strongly intensified oxygen and water vapor bands as compared with similar bands in lunar spectrograms. It was claimed that they prove that the water vapor in the Martian atmosphere is almost entirely confined to the regions over the melting snows at the poles of the planet. The amount of oxygen in the Martian atmosphere was estimated to be about half as great as in our own.

During the opposition of Mars, Prof. W. H. Pickering issued a series of monthly reports dealing with the planet. The cooperation secured by means of these reports proved so valuable that the formation of a permanent association for the systematic observation of the planet was contemplated.

THE NINTH SATELLITE OF JUPITER. In the YEAR BOOK for 1914, mention was made of the discovery of a new satellite of Jupiter by Prof. Seth B. Nicholson at the Lick observatory on July 21, 1914. The first record of this—the ninth—satellite of Jupiter was obtained on plates which had been exposed for the purpose of securing positions of the fainter satellites of the planet. It is a tiny body of the nineteenth magnitude only, and is therefore even fainter than the eighth satellite near which it was found. Like the latter, it is differentiated from the older satellites discovered by Galileo by its great distance from the primary, its small size, the high inclination of its orbit, and its retrograde motion. The latest determination of its elements gave for its distance from the primary 14,700,000 miles, or about 340 times the radius of Jupiter, and for its period 796 days. The corresponding figures for the eighth satellite are 13,950,000 miles and 739 days, respectively. The close resemblance between the orbits of the two satellites suggests they were added to the Jovian system in the same way, possibly by capture from outside space.

STELLAR PHOTOMETRY. In an important paper read before the National Academy of Sciences, Prof. Joel Stebbins, of the University of Illinois, gave an account of his recent researches on the electrical photometry of stars. In these researches he employed a selenium cell which served as one arm of a Wheatstone bridge, the intensity of the light falling on the cell from any bright source being determined from the diminution of the resistance of the cell. The difficulty of the problem

becomes apparent when it is realized that the measurement of the light of a star like the Pole Star with a probable error of 1 per cent is equivalent to the detection of a candle at a distance of about a mile. Increased sensitiveness of the apparatus was secured by surrounding the cell with an ice-pack so as to maintain it at a low temperature. Observations were made on eclipsing binaries of three types, namely, Algol, in which a bright star is accompanied by a large faint companion; β Aurigæ, a spectroscopic binary with components of practically equal size and brilliancy; and δ Orionis, in which the components are equally brilliant but unequal in size. The periodicity of Algol, which loses about $\frac{1}{10}$ of its light once in every 69 hours, the temporary eclipse lasting about 12 hours, was discovered in 1783 by Goodricke, who suggested as the cause of the phenomenon the periodical interposition of a large dark satellite. Unless the companion star is entirely dark, there should be another loss of light midway between two successive primary eclipses, but no such loss has ever been observed visually. With the selenium photometer, however, Stebbins was able to detect a diminution of about 6 per cent, proving conclusively that the companion, while dark, is not entirely so. In the case of β Aurigæ, spectroscopic observation has shown that we have a system of two bodies revolving round each other in a period of about four days. Although it is impossible to separate the two stars in the telescope, still the eclipses of one star by the other can be determined spectroscopically, for, whenever they occur, the spectrum lines are seen single instead of double, as they are when light waves are received from both components simultaneously.

The photometric observations showed that at the precise times when the eclipses take place the light of the system is diminished by 7 per cent, successive diminutions following one another at intervals of half the period. It was estimated that the surface brightness of each body is 12, and possibly 25, times that of the sun, the total light emitted by the system being from 150 to 300 times the solar light. In the case of δ Orionis, the observations indicated that the two components of the system have almost equal intensities but differ in size, the radius of the smaller being only half that of the larger. Professor Stebbins also succeeded in constructing a photoelectric cell from one of the alkali metals which is twice as sensitive as anything of the kind hitherto available, and far more uniform in its action than the selenium cell. A tenfold improvement over the best obtained with the selenium cell was expected from the later apparatus, and the results of the further prosecution of his researches were awaited with interest.

THE ORION NEBULA. In the YEAR BOOK for 1914, attention was drawn to the spectroscopic evidence of rotation in the Virgo nebula which had been recently obtained by Professor Slipher of the Lowell observatory. Further evidence of nebular rotation was found by Messrs. Buisson, Fabry, and Bourget in their studies of the great nebula in Orion. The interferometer method was used. Interference rings were formed with light of known wave-length from the nebula, and the wave-length for this particular ray was then calculated from the size

of the rings produced. Any decrease or increase of wave-length is of course due to the Doppler effect, and the radial velocity of the region of the nebula from which the light was derived can be easily determined. It was found that, on the whole, the nebula has a rotary motion about a line running from northwest to southeast, though many irregularities were observed; and that the northeast region is withdrawing at the rate of about 5 kilometers per second relatively to the axis of rotation, while the southwest region is approaching with about the same relative velocity. In the region surrounding the Trapezium a mean radial velocity of 15.8 kilometers per second relative to and directed away from the sun was obtained. The atomic weight of nebulum and the temperature of the nebula were also investigated. It was found that the two distinctive lines in the ultra-violet are emitted by an element of approximate atomic weight three, which agrees with the theoretical atomic weight of nebulum, but the conclusion was reached that the green line usually associated with that element belongs to another element of even lower atomic weight. The temperature of the nebula was estimated to be 15,000°C.

MEASURING THE HEAT OF THE STARS. In a recent contribution to the *Bulletin of the Bureau of Standards*, Prof. W. W. Coblentz described his important work of measuring the amount of heat radiated from the stars. Several previous attempts had been made to determine the amount of stellar radiation. One of the earliest was by Sir William Huggins, who employed a thermoelement to measure the minute amounts received from Sirius, Pollux, Regulus, and Arcturus, but his results were qualitative rather than quantitative. Stone, somewhat later, and, quite recently, Pfund, were more successful in their application of the thermoelement to this problem. Stone's observations were confined to Arcturus and Vega, and showed that the former emitted more radiation than the latter in the ratio of 3 to 2. Pfund investigated Jupiter, Vega, and Altair, and concluded that, with one of the largest reflectors and a more sensitive galvanometer, it would be possible to make measurements in the case of stars down to the fourth magnitude. In 1901 Nichols made use of his improved radiometer which was so sensitive that a candle placed at a distance of 5 miles would have given a deflection of 1 mm. on his galvanometer scale. For Arcturus and Vega he found a somewhat higher ratio than that obtained by Stone. The telescope employed by Professor Coblentz was the large Crossley reflector of the Lick observatory. By using for his radiometer a bismuth-platinum thermocouple mounted in vacuo, he succeeded in securing a sensitivity more than 100 times as great as that of the Nichols radiometer, so that a deflection of 1 mm. would be produced by a candle at a distance of 53 miles. Measurements were made on 112 celestial objects, including 105 stars, the bright and dark bands of Jupiter, a couple of Jupiter's satellites, the rings of Saturn, and a planetary nebula. Quantitative measurements of stars down to magnitude 5.3 were obtained, and it was found possible to get qualitative results in the case of stars as faint as magnitude 6.7. Red stars were found to emit from two to three times as much total radiation as

blue stars of the same photometric magnitude. As an indication of the extremely minute amounts of stellar radiation involved, it is stated that, if the radiation from the Pole Star falling on a square centimeter of the earth's surface could be absorbed and conserved, it would take a million years to raise the temperature of one gram of water 1°C, while the total radiation from all the stars similarly absorbed and conserved would require from 100 to 200 years. This is in marked contrast to the solar radiation, which can produce the same effect in about a minute.

MINOR PLANETS. Although the number of minor planets announced as new in 1911, 1912, and 1914 showed some diminution when compared with the numbers discovered annually during the period 1906-1910, there appears to be no indication that the exhaustion of the zone is near. Since the issue of the *YEAR BOOK* for 1914, 74 of these small bodies have been reported, and have been assigned provisional designations ranging from 1914 VS to WH, and 1915 WJ to YH, together with 1901a, 1913k to o, and 1914a and b, the single-letter designations being due to belated recognition or reporting. It will be observed that in 1915 we were nearing the end of the second series of double-letter designations. Of the 24 minor planets not properly belonging to 1915, the five designated 1913k to o were discovered by Metcalf at Winchester, Mass.; 1914a and b were found by Beljawsky at Simeis; and 1901a was detected on an old plate exposed by Wolf at Heidelberg as far back as 1901, having been overlooked at the time of its discovery. Of the remaining 16 belonging to 1914, 5 were reported from Heidelberg, 4 falling to the share of Professor Wolf, and 1 to his assistant Reinmuth, while the rest were discovered by Neujmin at Simeis. This year the Heidelberg observatory claimed more than half of the total number of minor planets announced as new, no fewer than 29 having been found by Wolf (27), and Reinmuth (2). Of the remaining 21, 9 were reported from Simeis (7 by Neujmin, and 2 by Beljawsky), 6 by Thiele (Bergedorf), 3 by Tomás Solá (Barcelona), 2 by Palisa (Vienna), and 1 by Demetrescu (Bucharest). One surprising feature of the year's work in this field was the number of long-missing planets which were re-observed. 1915 WJ, discovered by Wolf, proved to be the long-lost 99 Dike, last seen in 1868, the year of its first discovery, and 1915 XU is probably identical with 193 Ambrosia. Other minor planets not observed since their discovery and re-found in 1915 were 290 Bruna (1890), 353 Ruperta-Carola (1893), 392 Wilhelmina (1894), 493 Griseldis (1902), 573 Rebekka (1905), and 594 Mireille (1906); of these, 392 is identical with 1914 WG, 493 with 1915 WK, and 572 with 1915 WU.

Permanent numbers were assigned to the following minor planets:

Number	Temporary designation	Discoverer	Date of discovery
792	1907—ZC	Metcalf	1907—Mar. 20
793	ZD	Lowell	Apr. 9
794	1914—VB	Palisa	1914—Aug. 27
795	VE	Palisa	Sep. 26
796	VH	Reinmuth	Oct. 15
797	VR	Thiele	Nov. 17
798	VT	Wolf	Nov. 21
799	1915—WO	Reinmuth	1915—Mar. 9

Number	Temporary designation	Discoverer	Date of discovery
800	WP	Wolf	Mar. 20
801	WQ	Wolf	Mar. 20
802	WR	Wolf	Mar. 20
803	WS	Palisa	Mar. 21
804	WT	Comas Solá	Mar. 20
905	WW	Wolf	Apr. 17
806	WX	Wolf	Apr. 18
807	WY	Wolf	Apr. 18

Other identifications were as follows: 1914 VS = 490 Veritas; 1915 XO = 468 Lina.

COMETS. Three comets of short period—Winnecke's, Tempel's Second, and Swift's—were due to reappear in 1915. The first two were observed, and were designated 1915b and 1915c, respectively. Winnecke's comet, originally discovered by Pons in 1819 and rediscovered by Winnecke in 1858, has a period of 5.89 years, and since its rediscovery has been observed at every return except those of 1863, 1880, and 1903. It was detected by Thiele at Bergedorf on April 4 as an object of the sixteenth magnitude. Its perihelion passage occurred on September 1. Comet Tempel II was discovered by Tempel at Milan in 1873. Its period is 5.28 years. It was seen again in 1878, 1894, 1899, and 1904, but was not detected in 1883, 1889, or 1910 on account of its unfavorable position at each of these returns. Its return this year was first observed by Delavan at La Plata on May 16. It passed through perihelion on April 13. The comet discovered by Swift in 1889, with a period of about 9 years, was due to make its third reappearance, but as it had not been seen since its discovery, it was scarcely expected that it would be found this year.

Three new comets were discovered. These were designated 1915a, 1915d, and 1915e, respectively. The first two were found by Mellish at Madison, Wisconsin, the former on February 9, the latter on September 13. Comet 1915a was of the 11th magnitude at discovery, and presented the appearance of a circular nebulosity with vague boundaries. It had a very small nucleus excentric toward the sun, and a short fan-shaped tail. About the end of April it became visible to the naked eye, and attained its maximum brightness about the beginning of June. In May disintegration apparently set in, subsidiary nuclei being thrown off by the principal nucleus. Perihelion passage took place on July 25, its distance then being 110,000,000 miles. It was nearest to the earth about October 26, when it was at a distance of 47,000,000 miles. Comet 1915d passed through perihelion on October 13. Comet 1915e was discovered by Taylor at the Cape of Good Hope on December 2, but details concerning its magnitude, etc., were lacking at the end of the year. An object discovered at Harvard University by Miss Leavitt in February, and at first announced as Metcalf's comet, proved to be the minor planet 393 Lampetia.

OTHER EVENTS. The Bruce Gold Medal of the Astronomical Society of the Pacific was awarded to Prof. W. W. Campbell, director of the Lick observatory, for his distinguished services to astronomy; and Prof. Joel Stebbins, of the University of Illinois, was the recipient of the Draper Medal of the National Academy of Sciences.

BOOKS. Among the more important books on astronomy published during 1915 may be men-

tioned: *Tychonis Brahe Dani Opera Omnia*, vol. ii, edited by J. L. E. Dreyer; and W. V. Ball, *Reminiscences and Letters of Sir Robert Ball*.

ATHLETICS. See under the various sports, as BASEBALL, BASKETBALL, CYCLING, BILLIARDS AND POOL, BOWLING, BOXING, etc.

ATHLETICS, TRACK AND FIELD. The European war spoiled the year 1915 so far as international competition on the track and field was concerned. In the United States, however, this particular branch of sport thrived and several new records were established.

The most notable performance of the year was that of Norman S. Taber, who once wore the colors of Brown and Oxford universities. Taber ran the mile on the Harvard Stadium track at Cambridge, Mass., on July 16th, in 4 minutes, 12¾ seconds, the occasion being the try-outs for the national championships held in connection with the Panama-Pacific Exposition at San Francisco. The best previous figure for the mile was that set by W. G. George, a professional of Lillie Bridge, England, on Aug. 23, 1886. George's time was 4 minutes, 12¾ seconds.

George H. Goulding, of Toronto, Canada, also distinguished himself by walking seven miles in 50 minutes, 40¾ seconds, a new world's record. This feat was performed at New Brunswick, N. J., on October 23rd. E. E. Merrill up to this time held the record, having covered the same distance at Boston, Mass., on Oct. 5, 1880, in 54 minutes and 7 seconds.

Although Taber and Goulding deserve the highest mention, other names as well are entitled to special recognition. W. H. Meanix of the Boston A. A. established a record for the quarter-mile low hurdles at the Harvard Stadium in Cambridge, Mass., on July 16th, running the distance in 54¾ seconds.

Fred W. Kelly of the University of Southern California, tied the record for the 220-yard low hurdles, 24¾ seconds. Thomas J. Halpin of the Boston A. A. set a new mark of 1 minute, 13¾ seconds for the 600-yard run at the indoor national championships held at Madison Square Garden, New York, on March 2nd. Alvah T. Meyer of the Irish-American A. C. at the same time and place ran 300 yards in 32½ seconds.

The efforts of the officials of the Amateur Athletic Union to remove from its ranks those who commercialized their athletic skill were rewarded when Abel R. Kiviat of the Irish-American Athletic Club, New York, and Harry J. Smith of the Bronx Church House, New York, were convicted on charges of professionalism and barred from amateur competition for all time.

The National A. A. U. senior championships were contested at San Francisco on August 7th, during the Panama-Pacific Exposition. The Olympic Club of San Francisco won the team championship with a score of 30. The Irish-American A. C. of New York City finished second with 24 and the Illinois A. C. of Chicago third with 21.

Other clubs to score points were: Chicago A. A. 17; Boston A. A. 16; Kansas City A. C. 13; University of Wisconsin 11; Los Angeles A. C. 10; Multnomah A. C. 10; New York A. C. 9; University of Chicago 7; Salem-Crescent A. C. 7; Mohawk A. C. 5; Meadowbrook Club 5; University of Missouri 4; Caledonian Club 4; Boston Irish-American A. C. 3; Brigham Young

University 3; Notre Dame University 3; Long Island A. C. 3; Young Men's Gymnastic Club 2; Millrose A. A. 1.

In the junior championships also held at San Francisco, the Olympic Club was again a victor, scoring a total of 28 points. The Chicago A. A. was second with 27 points and the Los Angeles A. C. third with 24. Other scores were: New Orleans Association 21; New York A. C. 14; University of Notre Dame 11; Caledonian Club 10; Cincinnati Chamber of Commerce 10; Denver A. C. 8; Brigham Young University 8; Multnomah A. C. 6; Salem-Crescent A. C. 5; University of Chicago 5; Rock Island High School 5; Illinois A. C. 4; Millrose A. A. 3; Pittsburgh A. C. 2; Mississippi Agricultural Club 1.

The fortieth annual track and field meet of the Intercollegiate Association of Amateur Athletes of America was held at Franklin Field, Philadelphia, Penn., on May 28th and 29th. Cornell won the championship with a total point score of 45½. Harvard finished second with 26 and Yale third with 25. The standing of the other colleges was: Pennsylvania 21; Princeton 21; Dartmouth 14; Michigan 14; Columbia 10; Maine 9; Penn State 6; Johns Hopkins 1½; Massachusetts School of Technology 1; Bowdoin 1.

The University of Wisconsin won the annual games of the conference colleges of the Middle West with a total of 38 points. Chicago was second with 37 and Missouri third with 21. Other scores were: Illinois 18; Notre Dame 11; De Pauw 9; Northwestern 7; Lake Forest 5; Minnesota 4; Coe 3½; Ames 3; Ohio State 3; Iowa 2½; Kansas 1; South Dakota 1.

Madison Square Garden was the scene of the first indoor intercollegiate championships, Cornell making the best all-round showing of the teams entered. Alma Richards of Cornell set a new intercollegiate mark for the high jump with a leap of 6 feet 4 inches.

In the college relay races held at Philadelphia, Princeton won the two-mile event, making a new record of 7 minutes 55½ seconds. Other victors were: One mile, freshmen, Yale; one-mile, preparatory schools, Mercersburg; one-mile, high schools, Washington Central; one-mile, colleges, Pennsylvania; four-mile, colleges, Cornell.

Frederick W. Rubien, secretary-treasurer of the Amateur Athletic Union, made the following selections for All-America athletic teams:

All-America Athletic Team—100-yard dash, Joseph Loomis, Chicago A. A.; 220-yard dash, R. F. Morse, Salem-Crescent A. C.; 440-yard run, J. E. (Ted) Meredith, Meadowbrook A. C.; 880-yard run, LeRoy Campbell, University of Chicago; 1-mile run, Norman S. Taber, Boston A. A.; 2-mile run, Joie Ray, Illinois A. C.; 5-mile run, Hannes Kolehmainen, Irish-American A. C.; 10-mile run, Hannes Kolehmainen; cross-country running, Hannes Kolehmainen; 120-yard high hurdles, F. W. Kelly, Los Angeles A. C.; 220-yard low hurdles, F. Murray, Olympic Club, San Francisco; 440-yard hurdles, W. H. Meanix, Boston A. A.; walking, Edward Renz, Mohawk A. C.; marathon running, H. Honohan, New York A. C.; standing broad jump, W. H. Taylor, Illinois A. C.; running broad jump, H. F. Worthington, Boston A. A.; standing high jump, W. H. Taylor, Illinois A. C.; running high jump, W. M. Oler, Jr., New

York A. C.; three standing broad jumps, P. Adams, New York A. C.; throwing the discus, A. W. Mucks, University of Wisconsin; running hop, step and jump, D. J. Ahearn, Illinois A. C.; pole vault, S. Bellah, Multnomah A. C., Portland, Oreg.; putting 16-pound shot, P. J. McDonald, Irish-American A. C.; putting 56-pound weight for distance, M. McGrath, Irish-American A. C.; throwing 16-pound hammer, P. Ryan, Irish-American A. C.; throwing the javelin, G. A. Bronder, Jr., Irish-American A. C.; decathlon, Alma W. Richards, Cornell University.

All-America College Team—100-yard dash, H. L. Smith, University of Michigan; 220-yard dash, A. E. Ward, University of Chicago; 440-yard run, J. E. (Ted) Meredith, University of Pennsylvania; 880-yard run, LeRoy Campbell, University of Chicago; 1-mile run, I. D. Mackenzie, Princeton University; 2-mile run, D. F. Potter, Cornell University; 120-yard high hurdles, F. W. Kelly, University of Southern California; 220-yard low hurdles, F. Murray, Leland Stanford University; running high jump, W. M. Oler, Jr., Yale University; running broad jump, H. T. Worthington, Dartmouth University; pole vault, F. K. Foss, Cornell University; putting 16-pound shot, A. W. Mucks, University of Wisconsin; throwing 16-pound hammer, H. P. Bailey, University of Maine; cross-country running, J. W. Overton, Yale University.

ATKINSON, REV. EDWARD. English scholar, died March 1, 1915. He was born in 1819; educated at Cambridge; and ordained to the priesthood in 1844. In 1856 he was appointed master of Clare College, Cambridge, and continued to hold this post until his death. This tenure of the headship of a college is the longest on record at Cambridge. Although Dr. Atkinson's specialty was the classics, he was also an excellent German scholar, and was familiar with Dutch, Italian, and Anglo-Saxon. He was deeply interested in missionary work, and did much to further it.

AUBERT, MARIE JACQUES CHARLES. French admiral, died June 8, 1915. He was born in 1848, and entered the navy in 1864. After serving in various capacities until 1905, he was appointed chief of the general staff of the navy. This appointment he retained until 1909 when the Clemenceau administration was overthrown as a result of an investigation into naval shortcomings. In October of that same year he was appointed commander-in-chief of the second battalion. Two years later he became inspector of navy training establishments and shortly afterwards he returned to his old post as chief of the general staff. He reached the age limit for active service in 1913, but at the outbreak of the war in Europe returned by special request. At the time of his death he held the rank of vice-admiral.

AUCKLAND ISLANDS. A dependency of New Zealand (q.v.).

AUDION LAMP. See WIRELESS TELEGRAPHY AND TELEPHONY.

AURORA BOREALIS. See METEOROLOGY.

AUSTRALIA, COMMONWEALTH OF. A self-governing dominion of the British Empire, consisting of six original states and two territories. The temporary seat of the Federal government is Melbourne, in Victoria; the permanent capital will be Canberra, founded 1913, in the

Federal Capital Territory, which lies within the State of New South Wales.

AREA AND POPULATION. In the table below are shown by states and territories the estimated area and the population according to the census of April 3, 1911, compared with the population as estimated June 30, 1914:

	Squares miles	Population	
		1911	1914
New South Wales...	309,460	1,646,734	1,855,561
Victoria	87,884	1,315,551	1,421,985
Queensland	670,500	605,813	678,864
South Australia	380,070	408,558	438,173
Western Australia ..	975,920	282,114	323,952
Tasmania	26,215	191,211	196,758
Northern Territory ..	523,620	3,310	3,664
Federal Capital Ter..	912	1,714	2,868
Commonwealth ...	2,974,581	4,455,005	4,921,825

The population figures are exclusive of full-blooded aborigines. Their number is not known, as many of them live in the unexplored interior; but it is believed that they do not exceed 100,000. Full-blooded aborigines in the employ or within the settlements of whites numbered 19,939 at the 1911 census.

Of the total population in 1911, males numbered 2,313,035 and females 2,141,970. Persons born in Australia numbered 3,667,670; United Kingdom 590,722; other European countries, 73,949; New Zealand, 31,868; Asia, 36,442; America, 11,278; Africa, 4958; Polynesia, 3410; at sea, 4238; unspecified, 30,470. Unmarried males and unmarried females in 1911 numbered 1,506,877 and 1,276,666 respectively; married, 735,849 and 733,773; widowed, 63,675 and 128,068; divorced, 2360 and 2140; not stated, 4274 and 1323.

By occupation the population was thus classified in 1911: professional, 91,638 males and 52,973 females; domestic, 48,235 and 153,131; commercial, 236,499 and 50,188; transport and communication, 152,554 and 4837; industrial, 453,743 and 108,594; primary producers, 570,268 and 15,880; independent, 13,939 and 9116; dependents, 706,773 and 1,743,213; unspecified, 30,386 and 4038.

A feature of the distribution of population in Australia is the excessive tendency to accumulate in towns, especially in the capital cities. In 1911, the aggregate metropolitan population (i.e. the population of the state capitals with suburbs) was 1,694,329, or 38.05 per cent of the total population of the Commonwealth; as estimated for Dec. 31, 1912, 1,823,900, or 38.53 per cent. The capital of New South Wales is Sydney, which with suburbs had in 1911 629,503 inhabitants; capital of Victoria, Melbourne, 588,971; of Queensland, Brisbane, 139,480; of South Australia, Adelaide, 189,646; of Western Australia, Perth, 106,792; of Tasmania, Hobart, 39,937. The capital of the Northern Territory is Darwin, with 958 inhabitants in 1911. Population of the larger cities and towns at the 1911 census (the figures are for the "localities" named, in which case no clearly defined boundaries exist, but the figures represent the persons who returned themselves as belonging to the specified localities): Sydney, N. S. W., 107,133; Adelaide, S. A., 32,981; Ballarat, Vic., 38,686; Balmain, N. S. W., 31,961; South Brisbane, Qld., 21,332; Broken Hill, N. S. W., 30,953; Brunswick, Vic., 32,202; Carlton, Vic., 27,476; Collingwood, Vic., 20,254;

Fitzroy, Vic., 34,141; Footscray, Vic., 21,933; Geelong, Vic., 21,630; Glebe, N. S. W., 21,444; Hawthorn, Vic., 24,353; Hobart, Tas., 27,505; Launceston, Tas., 20,937; Leichhardt, N. S. W., 24,139; Marrickville, N. S. W., 25,993; Melbourne, Vic., 38,293; South Melbourne, Vic., 46,016; Newtown, N. S. W., 26,427; Paddington, N. S. W., 24,150; Perth, W. A., 31,300; Petersham, N. S. W., 20,407; Prahran, Vic., 25,489; Redfern, N. S. W., 24,275; Richmond, Vic., 38,559; St. Kilda, Vic., 25,449; North Sydney, N. S. W., 32,764; North Melbourne, 17,750; Brisbane, Qld., 17,715; Northcote, Vic., 17,491; Bendigo, Vic., 17,883; Toowoomba, Qld., 16,160.

Mean annual increase of population in the Commonwealth from 1881 to 1886, 3.86 per cent; from 1886 to 1891, 3.06; from 1891 to 1896, 1.86; from 1896 to 1901, 1.49; from 1901 to 1906, 1.38; from 1906 to 1911, 2.03; 1911 to 1912, 3.44.

Marriages, births, and deaths respectively in 1913: New South Wales, 16,307, 52,186, and 19,699; Victoria, 11,324, 35,970, and 15,474; Queensland, 5655, 19,731, and 6783; South Australia, 4094, 12,627, and 4693; Western Australia, 2572, 9218, and 2934; Tasmania, 1620, 5886, and 2131; Northern Territory, 16, 52, and 64; Federal Capital Territory, 6, 44, and 11; Commonwealth, 41,594, 135,714, and 51,789. In 1912, marriages numbered 42,147 (the highest ever recorded), births 133,088, and deaths 52,177.

Arrivals in the Commonwealth in 1913, 141,806; departures, 87,131.

RELIGION AND EDUCATION. The 1911 census made the following returns of the population classified as to religion: Christian, 4,274,414; non-Christian, 36,785; indefinite, 14,673; no religion, 10,016; object to state, 83,003; unspecified, 36,114. The Church of England had 1,710,443 adherents; Roman Catholics numbered 921,425; Presbyterians, 558,336; Methodists, 547,806; Baptists, 97,074; Congregationalists, 74,046; Lutherans, 72,395.

Persons of five years of age and upwards in 1911 numbered 4,019,372; of these, 139,749 were not able to read, and 95,727 were not recorded as to literacy.

The number of state, or public, schools, teachers, pupils enrolled, and the average attendance were as follows in 1912:

	Schools	Teachers	Pupils	Av. At.
N. S. W.	3,234	6,454	235,803	171,028
Vic.	2,178	5,567	209,209	154,410
Qld.	2,992	2,992	95,641	77,885
S. A.	768	1,473	58,273	40,838
W. A.	536	1,189	38,184	32,959
Tas.	396	840	25,368	19,561
N. Ter.	3	3	98	71
Total	8,398	18,518	662,576	496,252

In 1911, the enrollment was 633,850, and the average attendance 463,799. Statistics of private schools in 1912:

	Schools	Teachers	Pupils	Av. At.
N. S. W.	754	3,673	61,744	51,168
Vic.	548	1,856	56,035	45,000
Qld.	151	767	17,289	14,752
S. A.	174	681	12,031	9,430
W. A.	118	427	10,000	8,506
Tas.	116	360	6,933	5,041
N. Ter.	1	2	53	43
Total	1,862	7,766	164,085	133,940

In 1911, the enrollment in private schools was 160,794, and the average attendance 132,588.

PRODUCTION. The estimated value of the products of the Commonwealth in 1912 were as follows: agricultural, £45,754,000; pastoral, £51,615,000; dairying, etc., £20,280,000; forests and fisheries, £6,432,000; mining, £25,629,000; manufactures, £57,022,000. The estimated area under cultivation in 1912-13 was 17,368,000 acres, as compared with 16,642,000 acres in 1911-12. For some of the principal crops, the area harvested, in thousands of hectares, and the yield, in metric tons, are reported as follows:

	1,000 Hectares		Metric Tons	
	1912-13	1913-14	1912-13	1913-14
Wheat ..	2,970	3,758	2,508,357	2,812,614
Oats	354	348	285,105	269,455
Corn	127	134	212,255	233,012
Potatoes ..	52	69	425,054	438,060
S. cane....	34	*65	1,153,357	2,308,010
Raw sugar ...	.....	.....	131,338	245,371

* Productive and unproductive.

The number of live stock Dec. 31, 1911, and Dec. 31, 1913, is reported as follows: horses, 2,279,027 and 2,521,983; cattle, 11,828,954 and 11,483,882; sheep, 93,003,521 and 85,057,402; goats, 280,086 and 262,272; swine, 1,110,721 and 800,505; camels, 8403 and 10,822; ostriches, 1939 and 1908. The wool production of the Commonwealth, stated as in the grease, was 648,852,000 pounds in 1913, as compared with 726,409,000 pounds in 1912.

The value of the gold production in 1913 was £9,376,573. In 1912, the total mineral production was valued at £25,629,238, the shares of the states being: New South Wales, £11,226,602; Victoria, £2,331,294; Queensland, £4,175,355; South Australia, £584,458; Western Australia, £5,700,207; Tasmania, £1,493,502; Northern Territory, £57,820. Gold production in 1912 was valued at £9,879,928; coal, £4,418,025; silver-lead bullion and ore, £3,539,532; copper, £3,244,550; zinc, £1,766,459; tin, £1,348,992; lead, £342,762; silver, £336,719.

COMMERCE. Imports, domestic exports, and total exports have been valued as follows:

	Imports	Exports	
		Domestic	Total
1910	£60,014,351	£71,836,195	£74,491,150
1911	66,967,488	76,205,210	79,482,258
1912	78,158,600	75,961,563	79,096,090
1913	79,749,653	75,138,147	78,571,769
1914	73,945,664	.....	67,575,682

Leading imports in 1913, in thousands of pounds sterling: metal manufactures, 11,782; cotton and linen goods, 4574; woolen goods, 2146; silk goods, 1884; hats and caps, etc., 644; boots and shoes, 665; other apparel, 4477; timber, 2942; drugs, chemicals, etc., 2493; paper, 1997; spirits, 1375; arms and explosives, 953. Principal exports in 1913, in thousands of pounds sterling: wool, 26,277; hides and skins, 5546; wheat, 7987; butter, 3565; beef, 2652; gold specie, 2093; gold bullion, 972; gold in matte, 404; copper matte, ingots, ore, and bars, 2972; tallow, 2163; lead, 1848; timber, 1002; zinc concentrates, 2243; tinned meat, 1085; mutton, 1993; flour, 1864; tin ingots, 690.

Imports from and exports to the United

Kingdom in 1913 were £47,615,561 and £34,756,548 respectively; New Zealand, £2,513,934 and £2,356,990; India, £2,964,246 and £1,355,383; Belgium, £2,258,839 and £7,465,742; France, £625,397 and £9,684,362; Germany, £4,956,834 and £6,873,441; United States, £9,522,704 and £2,631,058; Japan, £918,681 and £1,429,310. By proclamation dated Sept. 7 and 8, 1914, the export of wheat and wheat flour to all countries except the United Kingdom was prohibited. Exceptions may be authorized. By proclamation of Nov. 12, 1914, the export of foodstuffs and fodder destined to foreign ports in Europe, on the Mediterranean and on the Black Sea, other than those of France, Russia (excluding Baltic ports), Spain, and Portugal was prohibited on the above date. By an order of July 7, 1915, the export of corn and oats was prohibited, except under authorization from the minister of commerce and customs.

COMMUNICATIONS. Government railway in operation June 30, 1914, is shown in the table below; the first column shows mileage, the second cost of construction and equipment (to the end of June, 1912), the third gross receipts, and the fourth working expenses for the year ended June 30, 1914:

	Miles	Const.†	Receipts	Expenses
N. S. W. ...	3,967	£55,514,903	£7,742,241	£5,409,820
Vic. ...	3,747	45,836,573	5,560,958	3,835,964
Qld. ...	4,713	27,751,227	3,680,561	2,393,395
S. A. ...	*2,168	14,927,649	2,389,200	1,545,700
W. A. ...	2,967	13,233,099	2,257,011	1,572,008
Tas. ...	519	4,253,013	380,168	222,713
N. Ter. ...	*145	1,040,702	*15,933	16,666

Total 18,226 £160,557,160 £21,976,072 £14,996,266

* To June 30, 1912. † To June 30, 1913.

Private railways in the Commonwealth in 1913 aggregated 1812 miles, of which only 960 miles were open to general traffic.

In a debate on the Kalgoorlie to Port Augusta Railway Loan Bill, the minister for home affairs stated that the East to West transcontinental line would be open for traffic by the end of 1916. Up to July 17th, between 700 and 800 miles of track had been laid out of a total of 1053 miles, and it was expected that the line would be finished by the end of 1916. Rails weighing 80 pounds per yard were used, and the scheme allowed for a speed of 30 miles per hour. In addition to the East to West and the North to South transcontinental railways there was also discussion during the year of a proposal to build a long line of railway from a point in South Australia through a portion of New South Wales and on to Queensland, chiefly for strategic and developmental purposes. This was discussed in a conference of premiers of the Australian states, and it was decided to hold a conference between the military advisers of the Commonwealth and the railway commissioners of the states.

From the standpoint of defense as well as from considerations of railway development the question of the unification of the railway gauges of Australia was an important consideration in 1915. At a conference of state premiers, held to consider this subject, it was decided that a commission of two railway experts of high reputation, preferably from outside Australia, should be appointed to consider this matter

from all points of view. These commissioners would be asked to advise upon the need of a uniform gauge, the most suitable gauge in view of the present circumstances and future prospects, the best method of carrying out unification, the benefits that will accrue to the states, and the probable cost. An interesting feature of the proposal was that one expert should be brought from the United States and one from Great Britain.

FINANCE. Commonwealth revenue and expenditure, respectively, have been as follows: in 1911-12, £20,548,520 and £20,548,520 (including payments to the states amounting to £5,824,423); in 1912-13, £21,907,084 and £21,907,084 (£8,119,930); in 1913-14, £21,740,423 and £21,740,423 (£6,282,999); in 1914-15 (estimate), £23,273,000 and £36,361,314 (£6,418,750). Estimated customs revenue in 1914-15, £11,702,000; estimated expenditure for defense and the fleet, £16,069,005. On June 30, 1913, the aggregate public debts of the states amounted to about £277,100,000, against which there were sinking funds of £5,700,000.

ARMY. The Commonwealth of Australia normally maintains a citizen army providing for universal training. This involves a certain number of men permanently employed, and land forces, which include senior cadets and rifle clubs, the whole being embraced in a comprehensive scheme for universal service. For some time after the federation in 1901, the military forces of Australia had been brought under a single control and reorganized, but it was found difficult to maintain interest in recruiting, and after a visit of inspection by Lord Kitchener in 1910 a scheme of compulsory training for the military or naval service, specifically for home defense, was adopted. No man was to be subject to foreign service unless he voluntarily enlisted therefor, and the various expeditions that left Australia in 1914 and 1915 were composed entirely of volunteers. The basis of military organization of the Commonwealth is that the troops of each of the six States shall be under the control and direction of a district commandant who is responsible to the minister of defense, and the Military Board at military headquarters. Each State is divided into training areas, in each of which is an area officer, who is assisted by one or two non-commissioned officers of the permanent and instructional staff. This system of universal service gradually became popular, and in but few cases were legal penalties required for shirkers, as public sentiment made evasion of military duty very unpopular.

In 1914 and 1915, however, the great European war required that Australia, like the other British colonies, should furnish its share of men, and an expeditionary force of 20,000 was raised in 1914, at the expense entirely of Australia, and a further force of 10,000 additional volunteers was sent soon after. The first convoy consisted of a division including a staff, three brigades, divisional troops, and one light horse brigade; and the second convoy consisted of line and communication troops, as reinforcement, two additional light horse brigades, one additional infantry brigade, and certain volunteer units. These forces, together with an expeditionary force from New Zealand, left Australia in November, 1914, and were disembarked at Cairo for the defense of Egypt. There a large camp,

with all conveniences, was established near the Pyramids, and the troops went into an elaborate course of training which included maneuvers by the various units. At the end of February it was reported that 39,000 troops had been sent out, as follows: Infantry, 600 officers, 19,000 men; cavalry, 320 officers, 70,000 men; artillery, 120 officers, 3400 men; engineers, 21 officers, 600 men; signal troops, 7 officers, 2100 men; line of communication, etc., 1800 officers, 4900 men. An offer of 10,000 additional troops to be sent in April was presented to the British war office, and further reinforcements were contemplated during the year. The cost of Australia's participation in the war up to June 30 was estimated at \$65,000,000. Up to Sept. 29, 1915, the Australian defense department reported that 63,357 men had been sent over seas, and that there were in addition a like number in training.

GOVERNMENT. Australia is a Federal Commonwealth within the British Empire. The executive authority rests in the sovereign acting through a Governor-General whom the sovereign appoints. The Governor-General is aided by a Federal executive council of seven ministers and certain honorary ministers. The legislative power is exercised by a Federal Parliament of two houses, the Senate and the House of Representatives. Senators are 36 in number (six from each state) elected for six years by universal suffrage. Representatives are elected by universal suffrage for three years. For the period 1913-16 the House is composed of 27 members for New South Wales, 21 for Victoria, 10 for Queensland, 7 for South Australia, 5 for Western Australia, and 5 for Tasmania. Governor-General in 1915 (from May, 1914) Ronald Cranford Munro-Ferguson.

The new cabinet which was formed Oct. 27, 1915, was constituted as follows: Premier and attorney-general, William M. Hughes; defense, Pearce; trade and customs, Tudor; external affairs, Mahon; navy, Jensen; home affairs, O'Malley; treasury, Higgs; postmaster-general, Webster; vice-president of the executive council, Gardiner; honorary minister, Russell.

HISTORY

INTERNAL CONDITIONS. The most noticeable fact in the history of Australia during the year was the increase in the enthusiasm with which the people supported the cause of the British Empire in the war. No more convincing evidence of loyalty could have been given than the increase in the number of recruits enlisting for active service in the army and navy. Furthermore, Australia began to furnish munitions to Great Britain, to take measures to injure German trade in the East, and to maintain an active interest and enthusiasm in the conflict. The different sections of the country were brought closer together in policy; everywhere the people manifested a desire in one way or another to be of service to the Allies. The depletion of the number of men in the country, caused by the recruiting for the war, brought about a serious economic crisis. The wheat crop, one of the mainstays of the Commonwealth, fell off until by July Australia had been compelled to import 1,800,000 bushels from the rest of the world and was badly in need of 10,000,000 additional bushels instead of the usual

exportation of 30,000,000 to 60,000,000 bushels. This state of affairs led the Australian government to take every effort to increase the wheat yield per acre in order to supply the mills of the country and the demand from the rest of the world. The exportation of great numbers of cattle to the United States and other countries also threatened a serious handicap to Australians. The increased demands from the Allies for food supplies and the smaller numbers of animals than usual in the country made it imperative that some action be taken in the matter. The suggestion that the exportation of cattle to any country other than England, France, Russia, or Italy be prohibited brought about a storm of protest and was not enacted into law. Early in January the Commonwealth withdrew its order prohibiting the exportation of wool to the United States. All exporters were compelled to guarantee, however, that this wool would not be re-exported after it reached America. The prohibition order was passed shortly after the beginning of the war in 1914 when it was found that Germany was purchasing from America some of the wool which originally had been sold out of Australia. In February the Federal Government of Australia, in accordance with a request from Great Britain, passed a bill authorizing such measures as might be necessary in order to obtain all the meat obtainable for exportation to Great Britain and the allied countries during the war. Under the provisions of this act the government discouraged the export of meat products to neutral countries. In September the Board of Trade of London announced that the British government with the hearty coöperation of Australia and New Zealand had purchased the entire control of frozen meat products in Australasia at a cost of \$250,000,000 a year. Food prices rose so high during the early part of the year and without apparent cause that the government in April began to take means to prevent a further increase. It also went into the business of exporting sheep, hogs, and cattle to the Allies, leaving the middleman out of the transaction. Late in April reports were current that Australia had expressed its willingness to relieve the Imperial government of the administration of Fiji.

ANTI-GERMAN SENTIMENT. The enthusiasm which Australia developed for the cause of the Allies brought about a counter feeling against the Germans and German trade in the East. This anti-German feeling in January compelled Herman Homberg, for six years attorney-general of South Australia, to resign. In August Atty-Gen. William H. Hughes made sensational charges that German companies with ramifications in the United States and Great Britain were controlling the metal trade of the Commonwealth and that this control hampered the output of munitions and the prosecution of the war. Attorney-General Hughes also alleged that the Australian metal companies by not annulling their contracts with these German firms passively assisted the enemies of Great Britain. His charges created a great sensation in Parliament and in the country at large and resulted in the suggestion that an Australian metal exchange be created, and that no one be permitted to purchase Australian metals or metallic products unless he was pro-British. Further charges were made that the American companies

buying Australian zinc and copper were financed by German capitalists.

FINANCIAL AFFAIRS. At the reassembling of Parliament in April Prime Minister Arthur Fisher stated that £3,500,000 would be needed for extra expenses of the troops, but that the Imperial government had agreed to lend £6,500,000 in addition to the £18,000,000 for which the Commonwealth was already indebted. This made a debt of £24,500,000 and it was understood that this soon would be increased to £33,000,000. On July 7th Prime Minister Fisher announced that a loan would be negotiated shortly by the government, and one week later a bill was introduced in the House of Representatives calling for a local loan of £20,000,000 at 4½ per cent interest. Both Houses of Parliament passed the bill on July 23rd. Prime Minister Fisher stated at the same time that the war to the last of June had cost the Commonwealth £3,000,000 sterling, that the Imperial government had furnished £15,500,000 and would soon lend an additional £9,000,000. In August the premier estimated a deficit of £50,500,000 in the revenues of the country, of which £34,000,000 would be met by various loans. The government decided to impose a heavy income tax on all incomes exceeding \$760, and expected by means of this additional tax to raise at least £4,000,000.

AUSTRALIA AND THE WAR. Late in December, 1914, Australia sent her second expeditionary force of 25,000 men to Europe to aid the cause of the Allies. The third force of 20,000 men was being recruited at the time in readiness for a call to the front. Popular sentiment responded enthusiastically to the demands made early in February by Senator Pearce, minister for defense, that all able-bodied men should enlist for the firing line and that all others should train at rifle clubs in order to be prepared when called upon. Speakers everywhere advocated enlistment, and promised that the government would take charge of the enlistment, training, and dispatching of forces to the front. At the opening of Parliament in April, Prime Minister Fisher accepted this responsibility on the part of the government and pleaded for more recruits. Late in April the Australian troops exhibited especial gallantry and bravery in attempting the passage of the Dardanelles, and received praise from Gen. Sir Ian Hamilton and other generals leading the British forces. This praise had the desired effect and immediately recruiting began in earnest in the Commonwealth. It was expected that Australia would soon be able to offer another 100,000 men to the Allies. Up till July the Commonwealth had furnished approximately 100,000 troops. Of this number some 2000 were killed in the fighting around the Dardanelles. In proportion to its population Australia led all the other countries in furnishing relief and benefits to the Belgians. Late in April a Belgian Flag Day was held in Melbourne, and this was followed in May by a Belgian Rose Day at which King Albert's birthday was celebrated. The proceeds of these two entertainments amounted to \$80,000. New South Wales, not to be outdone, appointed May 14th as a Belgian Day, and turned the state, particularly the city of Sydney, into a great fair. Almost \$500,000 was raised for the relief of Belgium, of which sum Sydney alone contributed \$100,000.

AUSTRALIA

MUNITIONS FOR THE ALLIES. In June the Australian government announced that it would soon begin to turn out munitions for the Allies. Senator Pearce, minister for defense, appointed a Special Munitions Committee consisting of Capt. J. Smith of the Naval Board, Captain Thring, director of naval ordnance, Colonel Dangar, chief of ordnance, M. Bell, chemical adviser of the Department of Ordnance, and S. McKay, a partner in the Sunshine Harvester Works. The object of this committee was to bring about coöperation between the committees appointed by the large commercial corporations throughout the country. The committee also was formed to consider the supply of munitions material to the Commonwealth by the Australian manufacturers, government manufacture of war materials, and contracts between the War Office and Australian manufacturers. Much criticism had been directed at Minister Pearce for his failure up till this time to aid the Allies by the manufacture of war munitions, but the minister produced evidence to show that the delay had been caused by a misunderstanding as to the quality of the steel and the size of the munitions to be manufactured. As early as September, 1914, Australia had offered to supply ammunition for eighteen-pounders, but Great Britain had not at that time accepted the Commonwealth's offer. In the month of September the entire membership of the House of Representatives, the lower legislative body of the Federal Parliament, pledged itself never again during the war to buy German products.

CABINET CHANGE. Late in October the Commonwealth prime minister, Mr. Andrew Fisher, resigned his position at the head of the Australian Cabinet in order to become Australian High Commissioner in London. He was succeeded by Mr. William M. Hughes, who continued at the same time to hold his former position of Attorney-General in addition to his new position as Premier. The membership of the new cabinet, October 27th, will be found above, given under the section *Government*. Mr. Hughes announced that his government would continue to support the mother-country with all possible vigor.

AUSTRIA-HUNGARY, or THE AUSTRO-HUNGARIAN MONARCHY. A central European monarchy, consisting of the Austrian empire, the Hungarian kingdom, and the territory of Bosnia and the Herzegovina. Vienna is the capital of Austria and the permanent residence of the sovereign; Budapest is the capital of Hungary. In these cities the common legislature (the delegations) convenes alternately.

AREA AND POPULATION. In the table below are shown the area and the population of Austria by crown-lands, of Hungary proper, of Croatia and Slavonia, of Bosnia, and of the Herzegovina. The population figures are those returned by the most recent censuses—for Austria and the Hungarian kingdom, the censuses of Dec. 31, 1900, and Dec. 31, 1910; for Bosnia and the Herzegovina, the censuses of April 22, 1895, and Oct. 10, 1910. As the censuses for Bosnia and the Herzegovina did not coincide with those for the main part of the monarchy, the totals shown below can be regarded as only approximate. Bosnia and the Herzegovina were not annexed until Oct. 5, 1908; hence, the population of the monarchy as constituted in 1900 was 45,405,267.

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AUSTRIA-HUNGARY

	Square miles	Population 1900	Population 1910
Bohemia	20,057	6,318,697	6,769,548
Bukowina	4,081	780,195	800,098
Carinthia	3,987	867,324	896,200
Carniola	3,842	508,150	525,995
Dalmatia	4,954	593,784	645,666
Galicia	30,308	7,315,989	8,025,875
Görs and Gradisca	1,127	222,897	260,721
Istria	1,914	345,050	403,566
Lower Austria	7,654	3,100,493	3,531,814
Moravia	8,580	2,437,706	2,622,271
Salzburg	2,762	192,763	214,737
Silesia	1,987	680,422	756,949
Styria	8,658	1,856,494	1,444,157
Tirol	10,302	852,712	946,613
Triest	87	178,599	229,510
Upper Austria	4,626	810,246	858,006
Vorarlberg	1,005	129,237	145,408
Austrian Empire	115,832	26,150,708	28,571,934
Hungary	109,216	16,838,255	18,264,538
Croatia and Slavonia	16,425	2,416,304	2,621,954
Hungarian King...	125,641	19,254,559	20,886,487
Austria and Hungary	241,478	45,405,267	49,458,421
Bosnia	16,289	1,348,581	1,631,006
Herzegovina	3,529	219,511	267,088
Civil population .....	....	1,568,092	1,898,044
Military .....	....	22,944	33,758
Bos. and Hera.	19,768	*1,591,036	†1,931,802
Monarchy	261,241	46,996,303	51,390,223

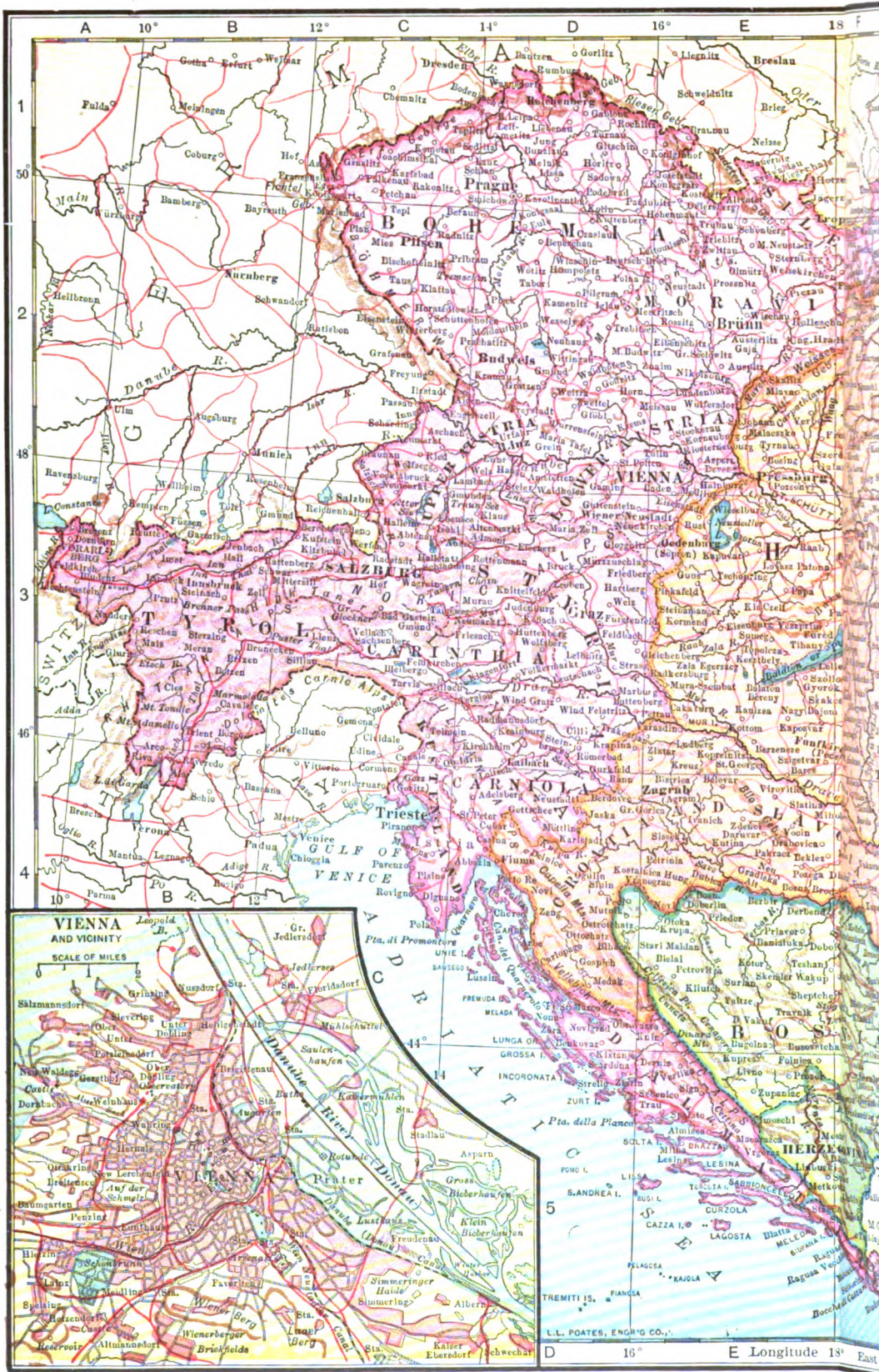
* Census of April 22, 1905. † Census of Oct. 10, 1910.

Transylvania, with an area of 22,318 square miles, is sometimes not regarded as a part of Hungary proper, as so much of its population is non-Magyar—in 1910, the vernacular of 55.0 per cent of the people was Rumanian and of 8.7 per cent German; the total population of Transylvania in 1900 was 2,476,998 and in 1910, 2,678,367. The 1910 census returned the population, according to vernacular, of Austria and of Hungary proper (including Transylvania) as follows:

	Austria		Hungary	
	No.	Per cent	No.	Per cent
German	9,950,266	35.58	1,908,357	10.40
Magyar	10,974	.04	9,944,627	54.50
Bohemian, Moravian, Slovak	6,435,983	23.02	.....	.....
Slovak .....	.....	.....	1,946,357	10.70
Polish	4,967,984	17.77	.....	.....
Ruthenian	8,518,854	12.58	464,270	2.50
Serbian and Croatian	783,334	2.80	656,324	3.60
Rumanian	275,150	0.98	2,948,186	16.10
Slovene	1,252,940	4.48	.....	.....
Italian and Ladin	768,422	2.75	.....	.....
Other*	608,062	....	401,412	2.20
Total	28,571,934	....	18,264,538	....

* Including, in Austria, foreigners, of whom about 800,000 Magyars.

The 1910 returns for Croatia and Slavonia, not included above, are: Croatian, 1,638,854 (62.5 per cent); Serbian, 644,955 (24.6); German, 134,078 (5.1); Magyar, 105,948 (4.1); Slovak, 21,613 (0.8); Ruthenian, 8307 (0.3); Rumanian, 846; other, 67,843 (2.6). The population of the monarchy in 1910, exclusive of the military in Bosnia and the Herzegovina, was 51,356,465; of this number, persons whose vernacular was German were returned at 12,010,669; Magyar, 10,067,992; Bohemian, Moravian,





or Slovak, 8,475,292; Croatian or Serbian, 5,545,531; Polish, 5,019,496; Rumanian, 3,224,755; Italian and Latin, 804,271; other, 860,365 (including foreigners in Austria to the number of 608,062); total, 51,356,465.

The population according to religion in 1910 is shown in the table below (exclusive of the military in Bosnia and the Herzegovina): Roman Catholics, *R.C.*; Greek and Armenia Catholics, *G.A.*; Orthodox (adherents of the Eastern Church), *Orth.*; Evangelicals of the Augsburg Confession, *Augs.*; Evangelicals of the Helvetian Confession, *Helv.*; Mohammedans, *Moh.*:

	<i>Austria</i>	<i>Hung.</i>	<i>Bos.-Herz.</i>	<i>Monarchy</i>
R. C.	22,530,169	10,888,138	434,061	33,852,368
G. A.	3,419,458	2,025,425	8,136	5,453,102
Orth.	667,065	2,987,163	825,418	4,479,646
Helv.	144,379	2,621,329	488	2,766,196
Augs.	444,307	1,840,143	5,854	1,790,304
Jews	1,318,687	982,458	11,868	2,258,013
Moh.	1,446	.....	612,137	613,583
Other	51,428	91,748	82	143,258
Total	28,571,934	20,886,487	1,898,044	51,356,465

In Austria in 1910, males numbered 14,034,022, and females 14,537,912; Hungary proper, 9,062,935 and 9,201,598; Croatia and Slavonia, 1,282,398 and 1,339,556 (Hungarian kingdom, 10,345,333 and 10,541,154); Bosnia and the Herzegovina (exclusive of the military, 33,758), 994,852 and 903,192; total, 25,374,207 and 25,982,258.

In Austria in 1910, there were 151 towns and cities with over 10,000 inhabitants, and seven cities with over 100,000; in Hungary proper, 85 and two; in Croatia and Slavonia, seven with over 10,000. Population of the larger cities and towns of Austria, Dec. 31, 1910: Vienna, 2,031,498; Prague, 223,741; Lemberg, 206,113; Triest, 160,993 (with district, 229,510); Cracow, 154,141 (including 2255 inhabitants of Plaszców, annexed in 1912); Graz, 151,781; Brinn, 125,737; Czernowitz, 87,113; Pilsen, 80,445; Königliche Weinberge (Vinohradý Královské), 77,120; Žižkow, 72,173; Pola, 58,562; Przemyśl, 54,078; Innsbruck, 53,194; Smichow, 51,791; Budweis, 44,538; Kolomea, 42,676; Laibach, 41,727; Aussig (Ústí nad Labem), 39,301; Mährisch Ostrau, 36,754; Tarnów, 36,731; Reichenberg, 36,350; Salzburg, 36,188; Drohobycz, 34,665; Tarnopol, 33,871; Stanislaw, 33,328; Wiener-Neustadt, 32,874; Prossnitz, 31,462; Götz, 30,995; Stryj, 30,895; Troppau, 30,762; Trient, 30,049. Population of the larger cities and towns of Hungary (including Croatia and Slavonia), Dec. 31, 1910: Budapest, 880,371; Szeged, 118,328; Szabadka (Maria-Theresiopel), 94,610; Debreczen, 92,729; Zágráb (Agram), 79,083; Pozsony (Pressburg), 78,223; Temesvár, 72,555; Kecskemét, 66,834; Nagy-Várard (Grosswardein), 64,169; Arad, 63,166; Hódmező-Vásárhely, 62,445; Kolozsvár (Klausenburg), 60,808; Ujpest (Neupest), 55,197; Miskolcz, 51,459; Pécs (Fünfkirchen), 49,822; Fiume, 49,806; Győr (Raab), 44,300; Kassa (Kaschau), 44,211; Brassó (Kroustadt), 41,056; Nyíregyháza, 38,198; Székesfehérvár (Stuhlweissenburg), 36,625; Kiskunfélegyháza, 34,924; Makó, 34,918; Szatmar-Németi, 34,892; Czegled, 33,942; Sopron (Oedenburg), 33,932; Újvidék (Neusatz), 33,590; Nagyszében (Hermannstadt), 33,489; Szentes, 31,593; Eszék (Esseg, Osjek), 31,388;

Szombathely (Steinamanger), 30,947; Zombor, 30,593. The capital and chief town of Bosnia, Sarajevo, had in 1910 51,919 inhabitants; Mostar, in the Herzegovina, 16,392.

Marriages, births, and deaths are reported as follows:

		<i>Births</i>			<i>*Deaths</i>
		<i>Marriages</i>	<i>Living</i>	<i>Still</i>	
<i>Austria</i> . . .	1909	218,083	941,239	23,857	646,122
	1910	214,970	928,545	23,275	602,046
	1911	217,373	898,702	22,243	628,805
	1912	212,187	903,407	22,275	592,426
<i>Hungary</i> . .	1909	178,885	776,395	15,959	526,798
	1910	179,537	742,899	15,667	490,689
	1911	193,482	732,767	15,149	524,496
	1912	182,373	765,991	16,310	491,722
<i>Bos.-Herz.</i>	1910	20,651	77,167	176	51,834
	1911	20,768	76,698	213	49,622
	1912	16,328	81,994	178	48,416

* Exclusive of still-births.

The table below shows the emigration from the monarchy, the share therein of Austria, and the number bound for the United States and Canada.

	<i>Aus.-Hun.</i>	<i>Austria</i>	<i>To U. S.</i>	<i>To Can.</i>
1909	250,580	129,808	170,191	10,916
1910	270,060	138,915	258,737	9,769
1911	163,962	91,868	159,057	12,105
1912	247,466	131,227	178,882	24,394
1913	309,950	194,462	.....	.....

Immigration is reported as follows: in 1909, 49,413; in 1910, 47,290; in 1911, 86,342; in 1912, 88,560.

EDUCATION. In both Austria and Hungary elementary education is free and compulsory. In Austria, children of school age numbered 4,885,504 in 1911, and 4,947,724 in 1912. The table below shows, for Austria, comparative educational statistics in 1911 and 1912: A, institutions for higher instruction, including the universities, technical high schools, theological seminaries, etc.; B, middle schools, including the gymnasia, realschulen, etc.; C, special public and private schools, including commercial and industrial schools, etc.; D, public and private elementary and grammar schools. The more important details, included in the foregoing classifications, are: E, universities; F, technical high schools; G, theological seminaries; H, gymnasia and realgymnasia for boys; I, gymnasia for girls; J, realschulen and lyceums for girls; K, commercial schools; L, industrial schools; M, agricultural and forestry schools; N, private elementary and grammar schools.

	<i>Schools</i>		<i>Teachers</i>		<i>Scholars</i>	
	1911	1912	1911	1912	1911	1912
A	75	74	3,732	3,844	41,226	42,198
B	680	708	14,506	15,311	180,208	184,818
C	5,848	5,873	27,885	28,065	404,958	412,379
D	28,226	24,532	110,607	113,353	4,583,784	4,615,508
E	8	8	2,069	2,136	25,231	26,363
F	7	7	895	952	9,889	9,845
G	48	48	329	327	1,923	2,018
H	292	307	6,704	7,088	95,933	99,675
I	24	32	244	375	8,254	4,048
J	146	149	3,480	3,651	47,562	47,909
K	353	358	2,993	3,264	44,803	48,709
L	1,757	1,820	12,476	13,241	185,516	191,294
M	216	217	1,818	1,892	8,638	9,069
N	1,261	1,285	5,921	5,974	143,886	144,115

The teachers and students respectively at each of the seven government technical high schools, in Austria, were as follows in the win-

ter semester of 1913-14: Vienna, 183 and 3177; Prague (German), 86 and 900; Prague (Bohemian), 151 and 2817; Graz, 54 and 817; Brünn (German), 102 and 924; Brünn (Bohemian), 73 and 569; Lemberg, 98 and 1791; in addition, the Vienna agricultural high school had 86 teachers and 1135 students. The Austrian government maintains 8 universities; teachers and students in the winter semester of 1913-14: Vienna (German), 666 and 10,310; Prague (German), 225 and 2282; Prague (Bohemian), 249 and 4713; Graz (German), 199 and 2203; Innsbruck (German), 139 and 1480; Czernowitz (German), 61 and 1194; Lemberg (Polish), 186 and 5871; Cracow (Polish), 195 and 3344. Of the total university students, about 8.5 per cent were women.

In Hungary, children of school age in 1912 numbered 3,548,365. There were 19,521 public primary schools, with 49,150 teachers and 2,969,444 pupils. Students at public middle schools numbered 86,378, and at higher city schools 98,125. Training colleges numbered 90, with 1229 teachers and 10,340 students; gymnasias, 192, with 371 teachers and 66,863 students; realschulen, 43, with 1044 teachers and 14,938 students. There are many special and professional schools. The technical high school at Budapest had 169 teachers and 1868 students. The Hungarian government maintains 5 universities: Budapest, with 412 teachers and 6962 students in 1912; Zágráb (Agram), 97 and 1096; Kolozsvár (Klausenburg), 137 and 2157; Debreczen and Pozsony (Pressburg), the last two founded in 1912. Theological seminaries numbered 47 (of which 29 Roman Catholic), with a total of 296 professors and 2007 students.

AGRICULTURE. The crops include all the common European products, while among those of the southern part of the monarchy are various sub-tropical fruits and plants. Of the total area, arable land constitutes about 35.37 per cent in Austria and 42.82 per cent in Hungary; gardens, 1.26 and 1.32; vineyards, 0.74 and 0.95; meadows, pastures, etc., 23.90 and 12.24; woodland, 32.63 and 27.41; lakes, marsh, etc., 0.35 and 0.20; unproductive (untaxed), 5.63 and 5.24. Among the leading agricultural products are cereals, potatoes, and other vegetables, sugar beets, fruits, flax, hops (in Bohemia), tobacco (especially in Hungary), and hay. The average yield of wheat during the years 1905 to 1914 is stated at about 16,072,000 metric quintals in Austria and 46,072,000 in Hungary; rye, 26,763,000 and 12,759,000; barley, 16,322,000 and 15,070,000; oats, 22,828,000 and 12,733,000; corn, 3,988,000 and 45,330,000; potatoes, 132,848,000 and 52,864,000; sugar beets, 63,871,000 and 30,353,000; wine, 4,776,000 and 4,481,000 hectolitres; hops, 135,560 and 9530 metric quintals; tobacco, 66,950 and 676,350; linseed, 236,700 and 58,000; flax fibre, 349,300 and 130,600; hemp seed, 134,500 and 230,900; hemp fibre, 176,600 and 590,000; rape seed, 246,800 and 216,000; silk cocoons, 2,214,000 and 1,767,000 kilograms. Area (in hectares) and yield (in metric quintals) as estimated for some of the important crops:

	Hectares		Quintals	
	1913	1914	1913	1914
Austria:				
Wheat	1,212,892		16,227,547	
Rye	4,935,425		93,451,550	

	Hectares		Quintals	
	1913	1914	1913	1914
Barley	1,092,131		17,501,568	
Oats	1,904,718		26,773,770	
Corn	285,531		3,379,655	
S. Beets	254,639		68,629,877	

Hungary proper:				
Wheat	3,115,962	3,489,724	41,190,237	34,139,144
Rye	1,079,904	1,117,205	13,273,594	12,117,271
Barley	1,168,446	1,123,789	17,380,022	14,619,447
Oats	1,166,957	1,074,729	14,487,030	13,146,071
Corn	2,918,767		46,248,082	
S. Beets	182,088		47,758,377	

Croatia-Slavonia:				
Wheat		300,000		2,100,000
Rye		66,000		528,000
Barley		52,800		422,400

Live stock statistics are shown below, for Austria (Dec. 31, 1900, and Dec. 31, 1910), for Hungary proper (Nov. 20, 1895, and Feb. 28, 1911), for Croatia and Slavonia (Dec. 31, 1895, and March 24, 1911), and for Bosnia and the Herzegovina (April-May, 1895, and October-November, 1910).

	Austria		Hungary	
	1900	1910	1895	1911
Horses	1,716,488	1,802,848	2,282,028	2,006,611
Asses	46,324	52,801	23,852	17,830
Mules	18,499	10,731	1,911	935
Cattle	9,511,170	9,160,009	5,696,905	6,028,232
Buffaloes		769	132,578	155,192
Sheep	2,621,026	2,428,101	8,122,681	7,696,881
Goats	1,019,664	1,256,778	308,810	331,383
Swine	4,682,654	6,432,080	7,330,091	6,415,197

	Cro. & Slav.		Bos. & Herz.	
	1895	1911	1895	1910
Horses	311,859	350,036	231,189	221,981
Asses	2,459	2,254	5,378	6,377
Mules	1,026	919	609	393
Cattle	908,780	1,134,664	1,416,394	1,308,930
Buffaloes			947	992
Sheep	595,902	850,161	3,280,720	2,499,422
Goats	22,418	95,592	1,447,049	1,398,068
Swine	882,973	1,163,493	662,242	527,271

In Hungary proper, the number of horses at the end of April, 1913, is stated at 2,005,019; asses, 16,157; mules, 905; cattle, 6,045,184; buffaloes, 161,683; goats, 268,752; swine, 6,824,657.

MINING AND METALS. In Austria, the total reported value of mining products increased from 233,145,531 kronen in 1905 to 315,486,476 in 1910, 352,545,531 in 1912, and 371,442,426 in 1913. Mining products (in metric quintals) in 1912 and 1913, and their value (in kronen) in 1913, were as follows:

	Metric Quintals		Kronen
	1912	1913	1913
Coal	157,978,895	164,598,889	172,334,415
Lignite	262,836,895	273,783,324	149,472,148
Iron ore	29,266,897	30,393,241	28,886,641
Lead ore	279,515	257,511	6,133,751
Silver ore	217,935	199,368	3,865,466
Mercury ore	1,177,797	1,306,083	3,175,455
Zinc ore	346,747	342,247	2,072,820
Graphite	453,748	494,562	1,983,807
Copper ore	173,537	163,533	1,542,296
Gold ore	301,920	359,940	719,880
Total, including others	453,392,880	472,222,676	371,442,426

The output of refined or prepared salt in 1912 was 3,657,888 metric quintals, valued at 47,314,803 kronen; in 1913, 3,375,629 quintals, valued at 46,313,806 kronen. The output of petroleum (and ozocerite) in Galicia increased from 7,973,484 metric quintals in 1905 to 20,-

884,569 in 1909, and then declined to 14,897,824 in 1911, and 11,458,163 in 1912 (11,441,332 quintals petroleum, 16,831 quintals ozocerite); the 1911 output was valued at 49,608,865 kronen, while the 1912 production, though of less quantity, at 59,695,236 kronen (57,234,546 for petroleum, 2,460,690 for ozocerite).

The value of furnace products increased from 103,205,734 kronen in 1905 to 143,951,194 in 1910, 179,212,612 in 1912, and 181,607,752 in 1913. These products in 1913 included: raw iron, 17,578,642 metric quintals, valued at 143,457,727 kronen; lead, 223,116 quintals, 10,706,814 kronen; zinc, 195,084 quintals, 10,366,981 kronen; copper, 36,845 quintals, 5,986,409 kronen; silver, 54,433.5 kilos, 5,264,916 kronen; gold, 283,587 kilos, 919,773 kronen; blue vitriol, 8966 quintals, 514,970 kronen.

In Hungary, the value of mining and furnace products increased from 79,487,936 kronen in 1895 to 106,743,742 in 1900, 106,173,334 in 1905, 152,837,807 in 1910, and 160,275,593 in 1911; these figures do not include the original value of raw products which have been turned into manufactures whose values are included. The more important mining and metal products (in metric quintals) in 1910 and 1911, and their value (in kronen) in 1911, were as follows (the original value of raw products which have been turned into manufactures is included):

	Metric Quintals		Kronen
	1910	1911	1911
Lignite	77,341,659	81,545,596	77,200,431
Raw iron	5,020,558	5,184,503	43,847,926
Coal	13,021,028	12,901,822	15,480,648
Iron ore	19,057,488	19,502,309	13,334,330
Gold	*3,041	*3,194	10,469,168
Coke	1,560,480	1,451,043	4,064,000
Iron pyrites	924,643	967,545	907,000
Silver	*12,547	*10,806	907,295
Lead	20,766	15,831	502,000
Bitumen	49,935	38,609	530,000
Antimony	7,815	8,921	487,000
Mercury	900	797	319,000
Copper	2,135	2,080	286,000
* Kilograms.			

The following values are reported for Hungarian mining and furnace products in 1912: lignite, 80,697,000 kronen; raw iron, 46,447,000; coal, 16,904,000; iron ore, 15,379,000; gold, 9,354,000; silver, 1,023,000.

COMMERCE. The tables below show the trade of the common customs territory. Imports of merchandise for domestic consumption, of total merchandise, of coin and bullion, and the total imports, in thousands of kronen:

	Mdse. Home Consump.	Total Mdse.	Coin and Bullion	Total Imports
1900	1,696,358	1,748,968	44,898	1,793,866
1905	2,146,133	2,213,145	55,982	2,269,127
1910	2,852,852	2,929,734	43,101	2,972,835
1911	3,191,711	3,275,208	41,414	3,316,622
1912	3,556,797	3,669,882	19,827	3,689,709
1913	3,406,592	3,508,700	35,619	3,544,319

Exports of domestic merchandise, of total merchandise, of coin and bullion, and the total exports, in thousands of kronen:

	Domestic Mdse.	Total Mdse.	Coin and Bullion	Total Exports
1900	1,942,003	2,061,705	66,546	2,128,251
1905	2,243,780	2,390,722	59,533	2,450,255
1910	2,418,606	2,587,640	80,930	2,668,570
1911	2,404,304	2,582,560	132,915	2,715,475
1912	2,733,855	2,926,665	178,420	3,105,085
1913	2,769,688	2,987,534	107,278	3,094,812

In the special trade, classified imports and exports were valued as follows in 1912 and 1913, in thousands of kronen:

	Imports		Exports	
	1912	1913	1912	1913
Raw mate'ls.	2,006,214	1,996,629	961,320	918,875
Partially mfd.	574,775	498,831	511,130	527,723
Manufactures	975,808	911,132	1,261,405	1,328,090
Total	3,556,797	3,406,592	2,733,855	2,769,688

In 1912 and 1913 respectively, the more important imports of merchandise for consumption were valued as follows, in thousands of kronen: raw cotton, 329,785 and 336,057; coal, coke, etc., 220,905 and 262,827; wool, 161,971 and 141,478; hides and skins, 102,254 and 115,571; silk and its manufactures, 123,144 and 114,408; coffee, 102,020 and 93,390; flax, hemp, and jute, 89,935 and 85,910; corn (maize), 105,682 and 83,806; machinery, 100,399 and 80,837; eggs, 66,574 and 68,518; copper, 83,172 and 63,660; tobacco, 61,987 and 46,560; rice, 28,351 and 36,242. Leading exports of domestic produce in 1912 and 1913 respectively, in thousands of kronen: sugar, 254,076 and 292,880; sawn timber, 164,036 and 157,094; eggs, 144,152 and 137,372; rough timber, 92,073 and 90,399; glass and glassware, 77,715 and 88,264; lignite, 78,508 and 76,425; woolen goods, 70,001 and 64,809; leather gloves and shoes, 54,050 and 60,623; malt, 66,143 and 55,697; cattle, 36,457 and 44,122; hops, 49,597 and 38,826; barley, 45,819 and 33,706; metal manufactures, 47,508 and 33,593; bed feathers, 19,138 and 19,093; beer (in casks), 16,252 and 18,817; fowl, 16,177 and 15,960; horses, 32,206 and 15,489; coal, 12,800 and 14,527; beans, 19,655 and 10,868.

The special trade in merchandise by principal countries, in thousands of kronen:

	Imports		Exports	
	1912	1913	1912	1913
Germany	1,405,594	1,366,731	1,212,907	1,500,540
United States	348,575	323,333	63,887	70,236
British India	199,314	233,195	63,434	94,676
U. Kingdom	245,862	217,468	257,373	269,822
Russia	228,811	202,857	91,328	103,299
Italy	161,662	169,047	239,399	215,591
France	119,800	113,465	84,270	80,239
Rumania	102,144	95,383	134,418	114,711
Switzerland	91,120	78,260	117,287	111,526
Brazil	80,010	68,535	13,812	12,010
Turkey	73,198	67,690	131,642	149,342
Argentina	47,110	48,495	21,974	22,667
Belgium	56,456	42,053	26,186	27,862
Egypt	36,376	34,796	31,938	33,256
Sweden	19,540	30,299	8,994	10,295
Netherlands	25,701	28,268	29,191	34,452
Du. E. Indies	37,718	25,765	3,433	8,032
Chile	22,359	23,314	2,328	1,956
Serbia	40,771	22,736	43,029	53,284
Greece	22,259	21,370	23,404	29,787
Total, including other	3,556,797	3,406,592	2,733,855	2,769,688

SHIPPING. There were entered at Austrian seaports in 1912 167,111 vessels, of 25,556,314 tons; in 1913, 173,511 vessels, of 27,877,722 tons (of which 161,088 vessels, of 25,445,061 tons, Austro-Hungarian). Vessels cleared at Austrian seaports in 1912, 167,122; of 25,569,882 tons; in 1913, 173,377, of 27,857,112 tons (of which 161,282 vessels, of 25,417,590 tons, Austro-Hungarian). At Hungarian (including Croatian) seaports, there were entered in 1911 37,250 vessels, of 4,664,645 tons; in 1912, 33,771 vessels, of 4,713,886 tons. Cleared in 1911, 37,210 vessels, of 4,651,998 tons; in 1912, 33,-

779, of 4,728,424 tons. The principal ports are Trieste and Fiume.

COMMUNICATIONS. As reported for the beginning of 1913, the length of railway in operation was 46,962 kilometers (29,181 miles), of which 23,200 kilometers were in Austria, 21,806 kilometers in Hungary, and 1956 kilometers in Bosnia and the Herzegovina. Most of the railway is under government operation. In 1912, there were in Austria 47,192 kilometers of telegraph lines, with 238,917 miles of wire and 7088 offices; in Hungary, in 1913, 26,388 kilometers of lines, with 160,712 kilometers of wire and 5171 offices; in Bosnia and the Herzegovina, in 1912, 3501 kilometers of line, with 10,444 kilometers of wire and 382 offices. Post offices in Austria in 1912, 10,450; in Hungary, 6610; in Bosnia and the Herzegovina, 240; in addition there were 36 Austro-Hungarian post offices in foreign territory.

FINANCE. The standard of value is gold. The monetary unit is the krone (crown), whose par value is 20.263 cents. The cost of administering the common affairs of the monarchy is borne by Austria and by Hungary in a proportion agreed to by their parliaments and sanctioned by the Emperor-King. The agreement renewed for 10 years in 1907 provides that the net proceeds of the common customs be applied to the common expenditure, and that the remaining expenditure be satisfied in the proportion of 63.6 per cent by Austria and 36.4 per cent by Hungary. The following table shows, for the common government, net expenditure (ordinary and extraordinary), net customs revenue, and the contributions of Austria and Hungary, in thousands of kronen:

	Expenditure	Customs Revenue	Contributions Austria	Hungary
1900	348,164	181,048	142,428	74,688
1905	438,070	148,630	198,748	95,392
1910	573,750	228,452	219,610	125,688
1911	553,572	222,717	210,424	120,431
1912	683,272	238,645	282,783	161,844
1913	934,989	227,669	449,856	257,464
1914*	782,819	97,252	436,021	249,546
1914-15†	778,244	216,455	357,298	204,491

* Sanctioned estimates for Jan.-June, 1914.

† Budget estimates for the year July, 1914-June, 1915.

Below are shown, for the common government, the avenues of net expenditure, in thousands of kronen (F. A., ministry for foreign affairs; A., army; N., navy; F., ministry of finance; C., high court of accounts):

	F. A.	A.	N.	F.	C.
1900	10,396	289,205	44,079	4,186	298
1905	11,770	335,618	86,055	4,316	316
1910	14,619	453,420	100,664	4,710	337
1911	15,996	411,840	120,666	4,735	335
1912	18,044	489,763	170,197	4,926	342
1913	19,690	699,832	210,155	4,953	359
1914*	12,413	634,221	138,525	2,478	182
1914-15†	19,629	575,940	177,267	5,048	360

* Sanctioned estimates for Jan.-June, 1914.

† Budget estimates for the year July, 1914-June, 1915.

The revenue and the expenditure of the Austrian government and of the Hungarian government have been as follows, in thousands of kronen:

	Austria		Hungary	
	Rev.	Expend.	Rev.	Expend.
1906	2,008,495	1,862,292	1,357,180	1,245,469
1907	2,253,052	2,209,093	1,395,710	1,399,473

	Austria		Hungary	
	Rev.	Expend.	Rev.	Expend.
1908	2,388,884	2,373,894	1,531,368	1,616,245
1909	2,795,703	2,888,648	1,750,783	1,721,564
1910	2,895,492	2,901,864	2,074,548	1,901,666
1911	3,082,782	3,004,085	1,830,779	1,768,349
1912	3,173,309	3,184,861	1,954,877	2,013,261

In Austria, the budget for the fiscal year 1914-15 showed estimated revenue of 3,460,987,902 kronen (3,194,355,951 kronen ordinary, 266,631,951 kronen extraordinary), and estimated expenditure of 3,460,726,156 kronen (3,064,872,060 kronen ordinary, 396,054,096 kronen extraordinary). The larger departmental avenues of total revenue and expenditure were estimated as follows:

	Revenue	Expend.
Finance	2,174,422,176	1,025,551,823
Railways	910,091,210	855,783,720
Contributions to common govt.		587,212,370
Commerce	256,585,460	244,268,873
Public Works	50,773,506	123,465,052
Interior	2,469,137	63,279,510
Defense	1,148,557	181,810,603
Worship and Instruction	18,627,710	125,759,100
Agriculture	27,136,736	64,659,731
Domains, new buildings, etc.	900,992	33,681,884
Pensions	10,000,528	140,018,371
Imperial household		11,300,000
Total, including other.	3,460,987,902	3,460,726,156

In Hungary, the budget for the fiscal year 1914-15 showed estimated revenue of 2,264,157,883 kronen (1,953,605,613 kronen ordinary), and estimated expenditure of 2,264,096,830 kronen (1,878,270,912 kronen ordinary). The larger sources of estimated ordinary revenue were: indirect taxes, 758,214,781 kronen; railways, 496,000,000; direct taxes, 326,077,000; state properties, etc., 170,609,045; posts and telegraphs, 111,280,000. The larger branches of estimated expenditure were: ministry of commerce, 519,433,580 kronen; national debt, 262,191,456; ministry of finance, 285,627,567; worship and public instruction, 132,620,783.

In Bosnia and the Herzegovina, the budget for 1913 showed estimated revenue and expenditure of 92,997,594 kronen and 92,987,887 kronen, respectively.

In accordance with the terms under which the union of Austria and Hungary was effected in 1867, no debts are contracted by the monarchy. The total general debt, contracted before that date, amounted on Jan. 1, 1914, to 5,141,254,657 kronen, of which 5,113,291,961 kronen formed the consolidated debt. On the same date, the Austrian debt was 7,467,346,388 kronen, of which 7,120,210,658 kronen formed the consolidated debt. The Hungarian debt in 1912 amounted to 6,592,846,069 kronen.

ARMY. See MILITARY PROGRESS, *passim*.

NAVY. On account of the great war, naval statistics cannot be given beyond 1914. On July 1 of that year, about one month before the war began, the number and displacement of warships of 1500 or more tons, and of torpedo craft of 50 or more tons, built and building, were as follows: dreadnoughts (battleships having a main battery of all big guns, that is, 11 or more inches in caliber): built, three, of 60,030 tons; building, four, of 93,510 tons. Predreadnoughts (battleships of about 10,000 or more tons displacement whose main batteries are of more than one caliber): built, six,

of 74,613 tons; building, none. Coast defense vessels (including smaller battleships and monitors): built, six, of 41,700 tons; building, none. Battle cruisers, none built or building. Armored cruisers: built, two, of 13,380 tons; building, none. Cruisers (unarmored warships of 1500 or more tons): built, five, of 13,815 tons; building, five, of 21,216 tons. Torpedo-boat destroyers: built, 18, of 9450 tons; building, none. Torpedo boats: built, 39, of 6852 tons; building, 24, of 5886 tons. Submarines: built, six, of 1686 tons; building, six, of 5370 tons. Total tonnage: built, 221,526; building, 125,982. On the date above mentioned, Austria-Hungary held eighth place among the nations in amount of warship tonnage completed and also in the aggregate of tonnage built and building. In the foregoing figures, certain vessels are not included, viz.: ships over 20 years old from date of launch unless reconstructed and rearmed within five years; torpedo craft over 15 years old; transports, colliers, repair ships, torpedo-depot ships, and other auxiliaries; vessels not actually begun or ordered, although authorized. See also NAVAL PROGRESS.

GOVERNMENT. The administration of the monarchy is directed by the Emperor-King, acting through three ministries, for foreign affairs, finance, and war. The admiralty is a department of the war ministry. The common government deals with finance relating to the monarchy as a whole, foreign affairs, the diplomatic, consular, postal, and telegraphic services, and certain state monopolies. The ministers are responsible to the two delegations. These bodies, consisting of 60 members each, are elected by the Austrian and Hungarian parliaments respectively; they convene each year, alternately at Vienna and Budapest. The delegations examine the requirements of the common services of the monarchy and advise the parliaments as to necessary appropriations. Austria and Hungary have each a representative parliament of two houses and a responsible ministry. Each of the Austrian crownlands has a diet, and there is also a diet for Croatia and Slavonia. Bosnia and the Herzegovina are administered under the (common) ministry of finance.

The sovereign in 1915 was Franz Joseph I, who was born Aug. 18, 1830. He became Emperor of Austria Dec. 2, 1848, and King of Hungary June 8, 1867. The heir presumptive was the Archduke Karl Franz Joseph, born Aug. 17, 1887, son of the late Archduke Otho Franz Joseph and nephew of the Emperor. The former heir presumptive was the Archduke Franz Ferdinand, son of the late Archduke Karl Ludwig and nephew of the Emperor; Franz Ferdinand and his wife, the Duchess of Hohenburg (Countess Chotek), were assassinated at Sarajevo, Bosnia, June 28, 1914.

The common ministry in 1915: Premier and minister for foreign affairs, Stephan (Baron) Burian von Rajecz (appointed Jan. 14, 1915); finance, Dr. Leon von Bilinski (later Dr. von Koerber); war, Gen. Alexander (Ritter) von Krobatin (appointed Dec. 10, 1912). Commandant of the navy, Admiral Anton Haas (appointed February, 1913). Premier of the Austrian ministry, Karl (Count) Stürgkh (Nov. 3, 1911); premier of the Hungarian ministry, Stephan (Count) Tisza (June 10, 1913).

HISTORY

CABINET CHANGES. An official communiqué, issued January 13, announced the resignation of Count Leopold von Berchtold from the ministry of foreign affairs and the appointment of Baron Stephan Burian von Rajecz to succeed him. As Count Berchtold's resignation occurred just at the time when the Triple Entente appeared to be on the eve of winning the active coöperation of Greece and Rumania, the dismissal of Count Berchtold was in some quarters, particularly in the press of France and Great Britain, interpreted as a sign that Austro-Hungarian diplomacy in the Balkans had failed and that Count Berchtold was blamed by the Emperor for the failure. In accordance with this view, the selection of Baron Burian as the new foreign minister was attributed to the fact that Baron Burian had gained valuable experience in dealing with Balkan races during his service as chief of the administration in Bosnia-Herzegovina, the Serb province of Austria-Hungary, and was considered to be especially conversant with Balkan affairs. In other quarters the supersession of Count Berchtold was ascribed to a lack of harmony between Count Berchtold and Count Tisza, the Hungarian premier; the new foreign minister, it was pointed out, was the son of a former Hungarian premier, and was himself Hungarian minister to the Royal Court; hence the appointment of Baron Burian would be extraordinarily gratifying to the Hungarian element in the Dual Monarchy. In passing, it may be remarked that immediately after Count Berchtold's resignation, the Emperor paid high tribute to Count Berchtold's work and conferred upon him the brilliants of the Grand Cross of the Order of St. Stephen. The new foreign minister announced that he would continue the policy of his predecessor, and as far as the public could discern, fulfilled the promise. The solidarity of Austria-Hungary and Germany was affirmed by a visit which Baron Burian made to Berlin, shortly after his appointment, and the conference he there held with the German government. As far as the Balkan policy of Austria-Hungary was concerned, it soon appeared that the success of the Entente in the Balkans had been exaggerated; Rumania and Greece remained neutral, and presently Bulgaria joined the Central Powers (see separate articles on Balkan States); there is no reason, however, to ascribe the credit for the altered situation to the personal work of Baron Burian, when other circumstances, such as the Anglo-French failure at the Dardanelles, may be adduced in explanation of the Entente's diplomatic failure. Early in February another cabinet change occurred, when the finance minister in the common ministry of Austria-Hungary, Dr. Leon (Ritter) von Bilinski, was replaced by Dr. Ernest von Koerber. The appointment received favorable comment in the Austrian press, as Dr. von Koerber was regarded as an exceedingly able financier, who would successfully pilot the Dual Monarchy through the financial troubles of war-time. In the Austrian cabinet an important change was made at the beginning of December. Three ministers—Dr. Karl (Baron) Heinhold von Udynski, Dr. Rudolf Schuster (Edler) von Bonnot, and Baron August Engel von Mainfelden—resigned their portfolios, and were succeeded respectively by

Prince Hohenlohe Schillingfuerst (minister of the interior), Ritter von Leth (finance), and Herr von Snitzmüller (commerce). The change was regarded as highly significant, because it proved that Austria's internal condition, and above all her economic situation, was sufficiently unsatisfactory to warrant a remodeling of the cabinet.

ECONOMIC CONDITIONS AND RUMORS OF DISCONTENT. As a result of the war's interference with industry and commerce, a grave economic situation arose within the Dual Monarchy. The shortage of grain in Austria, the scarcity of meat, and the enormous rise in food-prices caused severe hardship among the working classes. The gravity of the situation was grossly exaggerated by mendacious news items, emanating chiefly from Rome, Venice, and Geneva, which described bread riots in Vienna, conflicts between angry mobs and the mounted police, and other manifestations of popular unrest, with a wealth of picturesque detail. While most of such reports were absolutely without foundation, it could not be denied that the food question was serious. In the councils of the Austrian cabinet, and in the columns of Vienna newspapers, the supply and price of food were continually discussed. A full explanation of the measures which had been taken to control the situation was vouchsafed by the ministry on January 27th in reply to the questions put by a delegation of the Austrian Herrenhaus. Dr. von Schuster, the minister of commerce, explained that the government was taking steps toward the establishment of an official grain-purchasing society, which would amount to the same thing as a government monopoly of grain; measures were also being taken to restrict the consumption of grain; in the near future the government intended to forbid the use of fine wheat flour without the admixture of coarser meal; the use of flour for pastry would be curtailed; and the employment of foodstuffs for the manufacture of alcoholic beverages would be strictly regulated. In the course of the same conference, Dr. von Zenker, the minister of agriculture, categorically denied that the supply of flour would be exhausted. The army had supplies to last at least to August 31, 1915, and the bountiful crop of maize would reassure the most timid patriot that Austria's food supply would be amply sufficient for the needs of her population. The chief question was one of distribution. The only real shortage of provisions would fall upon horses and cattle, rather than upon the people. "The fact must not be overlooked," said Dr. von Zenker, "that a very appreciable scarcity of fodder materials might arise, since considerable quantities of barley and maize are now demanded for human consumption which formerly were employed for fodder. . . . In this connection special mention should be made of the possibility of using raw sugar for feeding cattle and the measures which have been introduced for the augmentation of the molasses supply." In spite of the government's energetic action in the question of the food supply, many complaints were heard because the more drastic measures which the German government had adopted were not imitated in Austria. The Austrian government had, to be sure, suspended the duties on grain, fixed maximum prices, and attempted in some

slight measure to restrict the consumption of grain; but these measures were not enough. The cost of living continued to soar. At last, on February 24th, the government replied to its critics by publishing a decree for the conservation of the grain and flour supply, ordering an official inventory of the supply of grain and flour on hand, and contemplating complete government regulation of the distribution of grain. Shortly afterwards the amount of flour which each individual might consume was definitely limited, and each person was given a card which must be punched for every ounce of flour consumed by him. These measures, together with the harvesting of a bountiful crop and the arrangements which were effected for the purchase of Rumanian grain, materially relieved the situation. Another aspect of Austria-Hungary's economic condition was the difficulty with which the war loans were raised. In January it was announced that the subscriptions to the war loan amounted to \$670,000,000, of which amount \$433,000,000 had been contributed by Austrian investors, and \$237,000,000 by Hungarian. Six months later the total subscriptions to the second Austrian war loan were reported as amounting to \$530,000,000. According to oft-repeated assertions from Italian and Swiss sources, these subscriptions were secured only with the greatest difficulty. Powerful pressure had to be brought to bear upon investors. Such reports were by their very nature impossible to verify, but at least it is certain that in order to bring the subscriptions up to the above-mentioned totals, the most strenuous and unflagging efforts were made by the Austrian newspapers to impress the investing public with a proper realization of its patriotic duty.

The reported lack of enthusiasm in the reception of the Austrian war loans, combined with the rumors of bread riots, convinced many observers and a very large section of the press outside of Austria-Hungary that the Dual Monarchy was suffering from internal exhaustion and would speedily collapse. Premature reports that Austria-Hungary was being compelled to send middle-aged men and mere striplings to the front, to take the place of the millions of soldiers killed or captured by the Russians, lent added certainty to this conviction. A contagion of cholera was reported to be raging in the military camps. Dispatches from Rome described lurid scenes of mob violence, the erection of barricades by the rebellious populace of Vienna, and crowds shouting "Down with War!" From Rome also came the statement that 300 peace meetings had been arranged for January 24 and prohibited by the Austro-Hungarian government. From correspondents in Geneva, Paris learned that rioting was frequent in the Slavic provinces of the Dual Monarchy as a result of the order for the mobilization of the last line reserves. A Zurich dispatch announced that Joseph Kotek, a leading Czech journalist, had been executed for treason against the Austro-Hungarian government. An eminent English historian, Mr. George Macaulay Trevelyan, informed the British public that the Austro-Hungarian authorities were employing the most cruel and despotic methods to prevent rebellion among the Slavic peoples of the monarchy. Young men, incorporated in the army against their will, were deterred from

deserting or rebelling by the fear that their families would be visited with cruel and unjust punishment. Hundreds of leading citizens, including many Roman Catholic priests, had been cast into prison, said Mr. Trevelyan, lest they should stir up the people to revolt.

THE LOYALTY OF HUNGARY. One of the most frequently repeated rumors of discontent in the Dual Monarchy concerned public sentiment in Hungary. The Magyars, it was suggested, were anxious for peace and bitterly hostile to Austria. The subordinate Slavic races of Hungary were in a ferment of nationalist agitation. Quite a different impression is gained from the public declarations of the Hungarian premier, Count Tisza, and from the records of the speeches in the Hungarian Parliament during the year. In a speech at Budapest, January 31, Count Tisza declared that the war had strikingly demonstrated the fundamental solidarity of the races within the Dual Monarchy. "Antagonism and divergence of opinions," he believed, "among the peoples of the Austro-Hungarian monarchy have disappeared." When the Hungarian Parliament met for its second war session, April 19, the House of Representatives enthusiastically applauded the opening address of its president, Herr von Beöthy, in which the confident determination to win the war was expressed. The following day, April 20, Herr von Beöthy again evoked ringing applause by reading a telegram from the commander-in-chief, Field Marshal Archduke Frederick, praising the gallantry of the troops, and declaring that the army was determined to fight "until our enemies are completely defeated and happy peace is achieved." When a bill to extend the age-limits during which citizens might be called upon for emergency service in the Landsturm—the new limits proposed included men from 18 to 50 years of age—was introduced, one after another the various parties in the House of Representatives signified their approval. Bakonyi, in behalf of the Hungarian Independence Party, suggested a few minor amendments, which were subsequently adopted by the government, and demanded that citizens who served in the army should be entitled to vote, but he upheld the bill as necessary to ensure the freedom of his country. Count Julius Andrássy, of the Constitutional Party, promised that the Opposition would vote for the bill in order to prove that "as long as Hungary is in peril, every Hungarian without exception has but one desire: victory." Stephan von Rakovsky, of the people's party, approved the bill and demanded that the military authorities should be less lenient in exempting men from military service. Guido Hreljanovic, in behalf of the Croats, declared that "the Croat nation has for centuries loyally fulfilled its duty to the King whenever called upon to do so"; he likewise would vote for the bill. Johann Juriga, a Slovak, referred with pride to the unswerving loyalty which the Slovak soldiers had manifested, and asserted that the Slovaks were willing to die in defense of Hungary; in return, he hoped that Hungary would generously recognize some of the hitherto unsatisfied nationalist aims of the Slovaks. Stephan Szabo, of the Farmers' party, approved the bill without reserve. The bill was then adopted, with only one negative vote, cast by Geza Polonyi. After

the Landsturm Bill had been passed, a bill to extend the mandate of the present Parliament was taken under consideration. The debate led to some interesting demands for electoral reform, but no serious opposition was encountered, and the term was extended from June 20, 1915, until six months after the conclusion of peace. Both bills were ratified without difficulty by the House of Magnates. Interpellations regarding rumored speculation and corruption in the business of buying supplies for the army led to a warmer debate in the House of Representatives. Perhaps the most interesting feature of the session was the bill submitted, April 29, by Stephan Rakovsky, in behalf of the People's Party, for the extension of the parliamentary franchise to include all who served in the army during the war, as a recognition of "the unparalleled bravery and self-sacrifice which our soldiers show on the field of battle." Count Tisza replied that the government could not accept the bill, inasmuch as it would lead logically to universal suffrage, and "on grounds that it would take too long to explain now, I believe that introduction of universal suffrage in Hungary would be a national misfortune." Accordingly the government majority in the House defeated the bill, although the Opposition voted solidly in favor of it. The winter session of the Hungarian Parliament was notable for the debate on foreign policy which occurred early in December. Count Karolyi at that time made a remarkable plea for peace, urging that the Central Powers were in so strong a military position that no hesitation need be felt about the propriety of discussing proposals to end the war. Count Andrássy, on the other hand, held that peace was still unattainable, inasmuch as Austria's enemies were not yet willing to admit defeat. Count Tisza, the Hungarian premier, made a significant reference to Rumania's apparent indecision, and expressed the belief that Rumania would best accomplish her national aims by siding with the Central Powers.

FOREIGN AFFAIRS. The break between Austria-Hungary and Italy is treated in the article on the WAR OF THE NATIONS (q.v.). The diplomatic correspondence between Austria-Hungary and the United States will be found under UNITED STATES AND THE WAR.

OTHER EVENTS. Veljko Cubrilovic, Misko Jovanovic, and Danilo Ilic, three of the conspirators convicted of complicity in the murder of the Archduke at Sarajevo, were executed on February 3rd. Two other conspirators, Jakob Milovic and Nedjo Kerovic, were fortunate enough to have their sentence of execution commuted to imprisonment respectively for life and for 20 years. A son was born to the heir apparent, Archduke Charles Francis, February 9. A sensation was caused by the reported dismissal and imprisonment of Field Marshal Moritz von Auffenberg, former chief of staff and war minister, who won the brilliant victory of Kamarow; von Auffenberg was accused of plotting to sell Austro-German military secrets to the Russians.

AUSTRIAN ACTIVITIES IN UNITED STATES. See UNITED STATES AND THE WAR.

AUTHORS' LEAGUE OF AMERICA. The league is a business association of authors for mutual service, benefit, and protection. All producers of books subject to copyright protection,

writers of novels, poems, stories, essays, text-books, etc., dramatic and photoplay authors, painters, illustrators, composers, sculptors, photographers, etc., can be admitted as regular members; publishers, theatrical managers, literary and dramatic agents, and others, can be admitted as associate members. The more important services which the league is able to do for its members are those of the legal, collection, mailing, and copyright bureaus. The legal bureau, without extra cost to a member, advises as to the signing of a contract or agreement with a publisher, theatrical manager, editor, or agent, etc.; receives and preserves the agreements of members in safe deposits, advises the producers of books as to proper conditions of sale; gives instructions and warnings to authors, publishers, motion-picture manufacturers, magazine contributors, etc. The league, through its collection bureau, helps its members to collect moneys and check accounts due under contracts. The mailing bureau gives information upon application; and the copyright bureau aids the members without cost except for the payment of registration fees plus the cost of money orders and postage. The officers for 1915-16 are: President, Winston Churchill; vice-president, Theodore Roosevelt; secretary and treasurer, Eric Schuler; general counsel, Arthur C. Nain; attorney, B. H. Stern; English agent, Curtis Brown.

AUTOLYSIN. The past year has brought forth the usual crop of alleged cancer cures, of which autolysin is perhaps the most notable. The remedy, known also as the Horowitz serum and the Horowitz-Beebe serum, is composed of a congeries of vegetable extracts, but the exact formula has not yet been divulged. The remedy has not been found of any value except by its exploiters who brought further condemnation upon it by the manner in which it was put before the public. See **CANCER**.

AUTOMOBILES, RACING EVENTS. A big boom in automobile racing marked the year 1915. This was in large measure due to the construction of speedways in all sections of the United States. During the year there were 22 contests held on roads and speedways and 59 on dirt tracks. It is estimated that about \$282,000 was distributed in prizes. Some 300 drivers competed in these events, 10 of them receiving \$220,000. Twenty-five others divided \$50,000. Four sanctioned hill climbs also furnished liberal prizes to the competitors.

Earl Cooper in a Stutz car was for the second successive year the most consistent winning driver, but to Dario Resta fell the honor of establishing the largest number of new records. Resta in a Peugeot at Indianapolis on May 31 covered 100 miles in 1 hour, 7 minutes, 29.59 seconds, and 150 miles in 1 hour, 40 minutes, 38.15 seconds. At Chicago the same driver went 200 miles in 2 hours, 2 minutes, 17.67 seconds; 300 miles in 3 hours, 3 minutes, 19.17 seconds; 400 miles in 4 hours, 4 minutes, 49 seconds, and 500 miles in 5 hours, 7 minutes, 26 seconds.

The winners and the average times made in the principal races of the year follow:

Vanderbilt Cup—300.78 miles—Resta in a Peugeot, 66.29 miles per hour; Grand Prize—402.75 miles—Resta in a Peugeot, 56.78 miles per hour; Elgin National—301.44 miles—Anderson in a Stutz, 77.25 miles per hour; Santa

Monica—445.2 miles—Cooper in a Stutz, 73.77 miles per hour.

INDUSTRIAL, ETC. The American automobile industry during 1915 was in a flourishing condition and many factors contributed to its progress and success. There was an extraordinary demand from Europe for motor trucks for the armies of the Allies as well as for passenger cars, and at the end of the year the estimated value of exports of commercial vehicles was given at \$63,000,000, an increase of 600 per cent, and for passenger cars \$37,000,000, an increase of 90 per cent. In the United States the demand for cars of all classes continued, particularly for the moderate and lower priced cars, and the number sold during the year was given at 842,249 passenger cars, of a value of \$565,856,450, and 50,369 motor trucks, of a value of \$125,922,500, making a total number of cars and trucks sold in 1915 of 892,618, with a retail value of \$691,778,950. In 1914 the exports of automobiles amounted to \$28,507,464, and in 1915 shipments to 80 different countries increased 250 per cent, and were estimated to exceed \$100,000,000, England alone taking some \$21,000,000 worth of pleasure cars and trucks. On July 1, 1915, 2,070,000 vehicles were registered in the United States, and in New York State on Dec. 1, 1915, there were 231,713, while in California on Oct. 1, 1915, there were 160,000 were registered, and in the 10 leading grain States 677,000.

In 1915 manufacturers of passenger and commercial cars numbered 448, while 257 manufacturers devoted their attention to commercial vehicles. Dealers, garage keepers, retail shops, and supply stores amounted in number to 27,700. The proportion of motor vehicles to population in the United States had steadily decreased, so that by 1915 there was one motor vehicle to each 48 inhabitants, and one to each mile of road. Iowa, with a total registration of 117,407 cars, had one car to every 19 persons. The average price of a passenger car had been reduced to \$672, whereas in 1899 for the steam runabouts then in use the average was \$1284, and in 1907, when the gasoline car was well developed, \$2123.

Registration taxes in 1915 exceeded \$14,000,000. The value of cars in 1899 was estimated at \$4,750,000, and the production in 1903 was valued at \$12,650,000, so that the output of cars and trucks in 1915, which nearly reached \$700,000,000 in value, was testimony as to the growth of the industry.

In the development of the automobile industry there naturally were striking improvements and the tendency towards efficient organization and general efficiency and economy of manufacturing exhibited in mechanical engineering had full play. With demand, facilities for manufacturing increased rapidly, and in many cases plants were extended so as to double and triple the output in successive years, and, with cars manufactured at a lower cost, there has been no sacrifice of strength or reliability. Indeed, the lower priced cars have shown relatively more improvement and better quality than some that have for years shown such special and careful workmanship as to sell at the top figures.

The engine developments in cars during 1915 were mainly in the direction of using an increased number of cylinders. The twin four and twin six, making 8 cylinder and 12 cylinder

engines set in pairs at a V angle, became popular and showed many advantages, especially a constant and even torque on the driving shaft and absence of vibration, and an ease and flexibility of control, as well as ability to accelerate rapidly. This innovation extended to moderate priced cars as well as those of high cost. Naturally the increased number of cylinders was accompanied by a reduction in size, a lessened weight of moving parts, and a much higher speed of revolution, so that there was a gain in horse power with but a relatively slight increase in the weight of the engine. The motor vehicle with the greater number of cylinders showed an advantage over the 6 cylinder car, which did not meet in many instances all the requirements for touring, where the country was rough and hilly. Naturally on all the higher and medium priced cars self-starting devices were furnished, and even with a number of the cheaper cars they were either supplied or could be fitted. The usual practice was to provide a small generator for starting and lighting, and a number of efficient systems were on the market and installed on well known cars.

One of the novelties of the year was a gas-electric drive, where a 6 cylinder engine was directly connected to a generator. This generator supplies current to a motor connected through the transmission system with the wheels. The engine is controlled by a throttle pedal of the usual type, and at the steering wheel there is a speed controller somewhat similar to the controller on an ordinary trolley car. The Entz system, as this new method of electro-magnetic transmission was known from its inventor, seemed to have great hill-climbing possibilities, and the engine could be readily accelerated as well as retarded and the car braked when necessary. The new method was the most radical invention that had been introduced in motor car practice in recent years, and the performance of the cars turned out on a commercial basis was attracting much attention.

The automobile industry was in such condition at the end of the year that it was estimated that in 1916 the motor car output would exceed 1,200,000 cars, and that there would be in the future a market for automobiles in the United States to the number of 5,000,000, as it was claimed that any person with an income of \$1200 could own and keep a car. A competent critic at the end of the year pronounced that the standard car of the future would have a small bore engine running at high speed of revolution, would weigh midway between the heavy and expensive car and the light and cheap runabouts, and that it would cost in the neighborhood of \$1200. When it was realized that the tendency was to decrease the price of the higher cost cars, and to improve, with corresponding increase of price, the cheaper cars, such a prophecy seemed justified.

AUTOSEROTHERAPY. See PELLAGRA.

AVIATION. See AERONAUTICS; MILITARY PROGRESS; and NAVAL PROGRESS.

BACILLUS. See BACTERIOLOGY.

BACTERIOLOGY. The studies that led up to the final demonstration of the elective affinity that certain bacteria and certain strains of bacteria have for particular tissues, constitutes one of the most interesting chapters in bacteriology. Forschner recognized this possibil-

ity as early as 1902. He discovered that streptococci obtained from a variety of sources when grown artificially on kidney tissue would, when injected intravenously, localize in the kidneys of animals; but the full importance of this elective tissue affinity was not realized until many years later. Rosenow succeeded in isolating streptococci from the lesions of acute rheumatism, gall-bladder infection, appendicitis, gastric and duodenal ulcer, and even erythema and herpes zoster. These streptococci, though not virulent, resembled each other closely in their cultural and morphological features. When injected into animals each strain showed a tendency to localize in the organ corresponding to that from which it had been obtained. Going further, streptococci with simple tissue predilection were isolated from recognized sources of infection, such as diseased tonsils and teeth. These organisms when first isolated were usually specific for certain tissues or organs, but this specificity was lost, however, by frequent passage through animals or artificial cultivation, and other tissue predilections were acquired. The appendix strains, for example, soon lost their specific quality and acquired affinity for the tissue of the stomach and gall-bladder. These experiences emphasize the importance of destroying possible foci of infection, such as diseased tonsils, or diseased teeth with pus pockets about their roots; since bacteria lodging there may be carried by the blood stream to distant organs or joints where they find a favorable habitat and where they may produce serious pathological conditions, and they also offer a possible explanation of the frequent association of appendicitis and gall-bladder disease. Rosenow's experiments further showed that virulence seemed to be one of the factors in determining the location of bacteria injected into the blood stream, and he argues that if this be true then the occurrence of ulcer and cholecystitis should become greater as the strains from the appendix are passed through animals; while on the other hand, appendicitis should occur oftener after inoculation with strains of bacteria from ulcers and cholecystitis which have lost their virulence by cultivation upon artificial mediums; and this was found actually to be the case. Other observations were that none of the strains from appendicitis attacked the pancreas, while the strains from ulcers and cholecystitis produced pancreatitis in from 3 to 5 per cent of animals injected. Lesions in the kidney were especially common after the injection of streptococci isolated from cases of rheumatic fever (39 per cent) and from endocarditis (20 per cent).

BACILLUS BULGARICUS. The use of sour milk in various diseases received a setback by the results of several investigations carried on during the past year. The object of sour milk therapy had been to implant organisms of the bacillus bulgaricus type in those parts of the bowel which were already the seat of undesirable putrefaction. The expectation was that the bacilli would displace or drive out the harmful bacteria, since it had been experimentally determined that the Bulgarian bacillus could flourish in an acid medium. Herter and Kendall were able to obtain an acid reaction throughout the intestinal tract of a monkey fed for two weeks on fermented milk, the acid reaction being more pronounced in the small

intestine than in the large. The reaction grew very faint toward the end of the intestine. The regions which are mostly the seat of fermentative processes failed to receive any benefit from the lactic acid bacilli. The latest contribution, that of A. H. Rahe, added evidence that the Bulgarian bacillus cannot adapt itself to the lower intestine of the human being. These investigations are important from the fact that not only sour milk of all kinds, but bacterial cultures, are used extensively by the American public with or without the advice of physicians. It seemed probable that the marvelous results attributed to sour milk in a wide variety of intestinal ailments might be due more to a change of diet and a partial deprivation from injurious foods, than to any specific action on the part of the bacillus itself. See also APPENDICITIS; HYGIENE; SURGERY; and TYPHOID FEVER.

BAHAMAS. The most northerly of the British West Indian colonies; a chain of about 20 inhabited islands and numerous islets and rocks. Total area, 4403½ square miles; population (1911), 55,944 (of whom 13,554 in the island of New Providence). Nassau, or New Providence, is the capital. Sponges are the principal export (£110,740 in 1910, £148,319 in 1913). The other products for export include preserved fruits (£9219 in 1910, £6208 in 1913), pineapples, oranges, and grapefruit. Area planted to sisal in 1913, over 20,000 acres; export, 7,249,496 pounds, valued at £69,950.

	1909	1910	1912	1913
Imports	£343,489	£329,014	£358,111	£408,529
Exports * . . .	165,116	188,286	276,115	263,954
Revenue	77,578	84,386	97,574	100,753
Expenditure . .	92,858	85,315	88,077	96,496
Shipping † . .	1,304,660	1,722,340	1,247,844	1,747,779

* Of colonial produce. † Tonnage entered and cleared.

Revenue and expenditure are for fiscal years. Customs revenue 1913-14, £83,928. Public debt (March 31, 1914), £43,829. There are 48 unsectarian government schools, with 6386 pupils. The population is mainly negro. W. L. Allardyce was appointed Governor in 1914.

BALFOUR, ARTHUR JAMES. See GREAT BRITAIN, *History, passim*.

BALKAN STATES. See ALBANIA; BULGARIA; GREECE; MONTENEGRO; RUMANIA; SERBIA; and TURKEY.

BALLOONS. See AERONAUTICS.

BANCROFT, WILLIAM H. American railroad official, died April 22, 1915. He was born in 1840 at Newburg, Ohio; was educated in the public schools there; entered the railroad service as a telegraph operator on the Michigan Southern; and was afterwards employed in other capacities on other roads. Rising rapidly, in 1862 he was appointed assistant superintendent of the Atchison, Topeka, and Santa Fé Road; served as superintendent of other roads; and in 1890 was appointed general superintendent of the Mountain Division of the Union Pacific. From 1897 until his death he was vice-president and general manager of the Oregon Short Line. At different periods he served as general manager of the Union Pacific and the Southern Pacific railroads.

BANDBOX THEATRE. See DRAMA, AMERICAN AND ENGLISH.

BANK CLEARING. See FINANCIAL REVIEW.

BANKS AND BANKING. The most striking feature of the banking history of 1915 was the marvelous strength shown by the banks of the United States. The fall of 1914 had been one of great uncertainty with possibilities of a banking panic. The obligations of America to various European countries for trade balances aggregated several hundred million dollars and envoys were sent to America to enforce collection. During the last seven months of the year gold exports exceeded \$175,000,000; but American banks, mainly those at New York, formed a gold pool of \$100,000,000 to meet immediately maturing obligations abroad and a cotton pool of \$100,000,000 to assist southern farmers in carrying an enormous cotton crop. By combining resources a basis for \$215,000,000 of clearing house certificates was secured, and before the completed organization of the Federal reserve system \$384,000,000 of emergency currency was put out. The banks thus entered 1915 with the most critical demands already met. Early in the year clearing house certificates were retired and emergency circulation was withdrawn. Gradually the improvement of trade resulted in an expansion of deposits and loans; confidence returned and banks in general experienced a profitable year. See AGRICULTURAL CREDIT; AGRICULTURAL LEGISLATION; BLUE SKY LAWS; FINANCIAL REVIEW; NATIONAL BANKS; STATE BANKS; SAVINGS BANKS.

According to reports of the Comptroller of the Currency there were on June 23, 1915, 27,064 banks in the United States of which 7605 were national, 14,598 State banks, 630 mutual savings banks, 1529 stock savings banks, 1664 loan and trust companies, and 1036 private banks. The aggregate resources of all of these institutions were \$28,275,000,000, an increase of over \$1,100,000,000 over June 30, 1914. Aggregate loans were \$15,850,000,000.

LEGISLATION. Numerous laws regulating banking were enacted in the various States. State banks were authorized to join the Federal reserve system by various States. Idaho, Kansas, Michigan, Nebraska, New Mexico, and other States raised the requirements and increased the regulation of trust companies. Kansas enacted a law preventing a bank engaged in trade or commerce from investing in the stock of other banks or corporations, or dealing in their own shares unless to prevent loss on debts previously contracted. The guarantee of bank deposits was provided for in Indiana and South Dakota, thus evidencing the gradual growth of favor for this principle in Middle Western States. A general codification of banking laws was carried through in South Dakota; and general laws for the regulation of banks and the creation of a State Banking Department were enacted in Montana. In Indiana, New Hampshire, New Mexico, and Washington general laws regarding the incorporation of various kinds of banks and their regulation were enacted.

FEDERAL RESERVE SYSTEM. The first year of the Federal reserve system was completed Nov. 16, 1915. It should, however, be noted that the opening of reserve banks had been expedited on account of a temporary money stringency due to the war. The result was that the final details

of regulation for the conduct of the reserve banks were not issued until several months later. Moreover, so effective were the measures taken to prevent a collapse of credit and so phenomenal was the growth of business during 1915 that throughout nearly all of the year the money market was easy and there was a gradual retirement of emergency currency and clearing house certificates. Nevertheless the first year's operations produced numerous significant results and brought forward various plans for the extension of the services of the system. Among the accomplishments may be mentioned the following: there was considerable progress in the standardization of commercial paper, and along with that a standardization of discount rates by city banks owing to the rediscount rates published weekly by the reserve banks; new regulations regarding exercise of trustee and executor powers by banks placed a premium upon sound banking; a system of bankers acceptance business was begun; the first steps in the development of a national system of clearances and check collection was inaugurated; and there was a considerable education of bankers and business men in essential principles of sound banking and credit. There was discussion, too, of the proposal to establish foreign branches, but at a session of the Federal Reserve Board on October 12th it was decided that the best policy was not to compete with member banks in the establishment of foreign branches, but to merely cooperate with and encourage member banks in such a policy. The National City Bank of New York had undertaken in 1914 and 1915 the establishment of branches in Latin America, and it was deemed unwise for the Federal reserve system to enter into competition in the same field. It was, however, deemed desirable to ask Congress for an amendment to the Federal Reserve Act which would enable American member banks to cooperate in establishing joint foreign agencies. This position of the Federal Reserve Board would not prevent them from establishing a joint agency for member banks in any foreign city where member banks had not themselves already established branches. In the fall Secretary of the Treasury McAdoo announced that the government would deposit \$30,000,000 in gold in the Federal reserve banks of Atlanta, Dallas, and Richmond for the relief of cotton growers. The plan permitted Southern banks to draw upon this fund without interest for whatever amount planters would borrow on their cotton warehouse receipts, it being understood that the planters would be charged not more than 2 per cent interest. This action was due in part to the placing of cotton on the contraband list by Great Britain. On November 24th Attorney-General Gregory rendered an opinion at the request of the Federal Reserve Board that under the Reserve Act the Board was given no authority to remove a reserve bank from the city in which it was ordinarily placed by the Organization Committee to another city of the district. Thus, for example, the Board could not remove the reserve bank of the Fifth Reserve District from Richmond to Baltimore.

FEDERAL RESERVE CLEARING SYSTEM. The Federal Reserve Act gave the Board authority to develop a system of clearances among member institutions. The first step in this direction was the inauguration of a plan of intra-district clearing. By this plan each reserve bank under-

took to serve as a clearing house for all member institutions, thus greatly facilitating settlements between banks within each district. The second step was the establishment of the Gold Settlement Fund, the completion of preliminary arrangements for which was announced on April 7th. This fund was to be created by deposits in gold by the 12 reserve banks to be held at Washington and used in liquidating balances among themselves. The deposit of each bank would be counted as part of its reserve. Thus the Federal Reserve Board at Washington would serve as a clearing house for the 12 reserve banks. Two other steps in the development of a completed system of national clearances were contemplated. If the plan for intra-district settlements should prove successful there would be developed a plan for inter-district settlements whereby the member banks of one district could settle claims against those of other districts. The final step taken was the creation of a "par list," or a list of banks, checks upon which would be collectible without exchange. While enrollment on such a list would be voluntary, it was believed that the competitive advantage of such enrollment would induce banks to join in the plan. It was believed, too, by many that these steps in the development of a clearance system would virtually introduce the fundamental principles of a central bank.

RESERVE SYSTEM AND THE TRUST COMPANIES. The Federal Reserve Act gave the Reserve Board authority to grant national banks the privilege of transacting a trust business or exercising the functions of trustee, executor, administrator, and registrar of stocks and bonds, when such action was not in violation of State law. The object of this provision was to maintain an equality of banking privileges between national and State banks, the latter being admitted to the reserve system on the same conditions as national banks. On February 15th the Board issued a statement of conditions under which national banks would be given trust company privileges, and numerous applications were soon filed. In some States the State banks and trust companies fearing the competition of national banks at once sought to induce State authorities to prevent the exercise of the new privileges. Several State Legislatures were persuaded to prohibit trust functions to national banks; while several others in the West and Middle West expressly authorized national banks to exercise the new functions. The trust companies further sought judicial opinion to sustain their view and arranged to bring to test the constitutionality of this provision of the Reserve Act.

STATE BANKS AND THE RESERVE SYSTEM. Early in the summer the Reserve Board issued a statement of the regulations under which State banks might enter the system. These permitted the withdrawal of State banks that had become members; and permitted State banks becoming members to continue to exercise their statutory and charter rights. Thus they could continue to make loans on real estate, a privilege not permitted national banks. Admission is at the discretion of the Reserve Board, and only strong institutions are to be taken in. Reliance as to their condition will be very largely placed in State examinations so as to avoid unnecessary expense and duplicate examiners.

STATISTICS. The resources of the 12 Federal

Reserve Banks on Dec. 24, 1915, aggregated \$490,808,000. In this were included gold reserves of \$347,381,000, and bills discounted and bought \$54,421,000. The liabilities included capital paid in amounting to \$54,901,000, reserve deposits of \$398,603,000; government deposits of \$15,000,000; and reserve notes in circulation of \$14,670,000.

BAPTISTS. Statistics of the Baptists in the United States in 1915, according to the *American Baptist Year Book* for that year, give the total number of 5,932,364, as compared with 5,799,253 for 1914. The total number in the world, according to the same authority, was 7,003,737 in 1915, as compared with 6,846,286 in 1914. There were in the United States in 1915, 2000 Baptist associations, 52,410 churches, and 37,371 ordained ministers. The Baptists in the United States are divided into two main, and a number of smaller branches. The two main branches are known as the regular Baptists, and include the Northern and Southern Baptists. The Northern Baptists had in 1914, 1,291,668 communicants, 9534 churches, and 8250 ministers. The Southern Baptists had in 1914, 2,522,623 communicants, 24,288 churches, and 14,909 ministers. The larger of the smaller subdivisions are the Primitive Baptists, with about 100,000 communicants; the Free Baptists (see below); the Free Will Baptists, with about 60,000 communicants; and the General Baptists, with about 34,000 communicants. The denomination has a large colored membership in the South. There were, in 1915, about 2,000,000 communicants in the regular colored Baptist denomination. There are in addition several smaller divisions of the colored Baptists. The general work of the larger denominations is in the hands of the Northern Baptists' Convention, and the Southern Baptists' Convention. The meeting of the Northern Baptists' Convention was held at Los Angeles, Cal., in May. The Southern Baptists' Convention was also held in May. The missionary work of the denomination is conducted by the American Baptist Foreign Missionary Society and the American Baptist Home Missionary Society. Missions are maintained in practically all quarters of the globe. For foreign missions there were contributed in 1915, \$1,231,664, as compared with \$1,206,202 in 1914; for home missions, \$965,698, as compared with \$959,557 in 1914; and for State missions, \$1,059,914, as compared with \$993,893 in 1914. The total contributions for all purposes in 1915 amounted to \$29,043,181, as compared with \$27,549,711 in 1914. The Baptists maintain 14 theological seminaries and have under their control 100 academies, colleges, and universities. There were, in 1915, 42,769 Sunday schools, with 325,475 officers and teachers, and 3,288,992 scholars. The Sunday school work and the publication work is done through the Sunday school board. For an account of the movement to unite the Baptists and Free Baptists, see BAPTISTS, FREE.

BAPTISTS, FREE. The union between this denomination and the regular Baptist denomination is for practical purposes completed. The union of State organizations has been almost entirely accomplished in most of the States. In some cases the designation United Baptist is made. The union between the denominations was inaugurated in October, 1911, by the transference on the part of the Free Baptists of their missionary and denominational activities to the

three national mission organizations of the Baptists, the American Baptist Foreign Mission Society, the American Baptist Home Mission Society, and the American Baptist Publishing Society. No statistics of the present membership of the denomination are available.

BAR ASSOCIATION, AMERICAN. The annual meeting of the association in 1915 was held in Salt Lake City, August 17th-19th. In connection with the meeting was held a conference of the commissioners on State laws. The American Institute of Criminal Law and Criminology held its seventh annual meeting in connection with the association. Several distinguished South American jurists were present, and delivered addresses. The various committees of the association made reports, and the President, W. Mel-drim, delivered the annual address, including with it a summary of the most important legislative enactments made in the State Legislature in 1915. Addresses were also made by Hon. Joseph W. Bailey, Hon. Simeon E. Baldwin, Felix Frankfurter, and other well known authorities. The following officers were elected: President, Elihu Root; Secretary, George Whitelock; Treasurer, Frederick Wadhams. The membership of the association in 1915 was about 10,000.

BARBADOS. The most easterly of the Caribbean Islands; a British colony. Its area is 166 square miles, and its population (1911), 171,892. The withdrawal of many laborers from the colony to the Canal Zone, together with emigration to Pará (Brazil) and the United States, accounts for the decrease in population since 1891, when it was 182,306. Bridgetown is the capital, with 16,648 inhabitants in 1911. The area under sugar-cane, the island's most important product, is estimated at 64,000 acres. There were in operation 320 sugar works in 1913, producing 9939 tons of sugar and 82,600 puncheons of molasses. The export of cotton to Great Britain in 1913 was 433,099 pounds, valued at £28,460. In the following table, imports, exports, and shipping are for the calendar years named; revenue and expenditure for the fiscal years.

	1909-10	1910-11	1911-12	1912-13
	£	£	£	£
Imports	1,119,343	1,345,194	1,465,481	1,853,059
Exports	888,086	1,088,830	1,085,569	856,618
Revenue	195,803	213,297	234,126	214,865
Expenditure	199,624	211,949	230,389	222,177
Shipping *	2,437,086	3,395,085	3,346,982	3,771,598

* Tonnage entered and cleared.

Customs revenue (1913-14), £125,478. Public debt (March 31, 1913), £436,900 (sinking fund, £113,340). Acting Governor in 1914, W. L. C. Phillips.

BARD, THOMAS ROBERT. American public official, former United States Senator to California, died March 5, 1915. He was born in Chambersburg, Pa., in 1848; received an academic education; studied law, but did not practice. He was engaged as transportation agent for the Cumberland Valley Railroad at Hagerstown, Md., in 1861. While in Maryland, he took an active part in a political campaign to prevent the secession of that State. On several occasions he acted as a Union scout. In 1865 Thomas A. Scott, then Assistant Secretary of War, and later president of the Pennsylvania Railroad, sent Bard to Southern California to

take care of his lands there. In California, Bard settled permanently in Hueneme, Ventura County, and in 1867 was elected to the Board of Supervisors. He filled other offices, and was elected to the United States Senate in 1900, serving until 1905.

BARKER, GRANVILLE. See **DRAMA, AMERICAN AND ENGLISH.**

BARLEY. Weather conditions of 1915 were generally favorable to the growth of the barley crop, especially in the principal producing countries, and while the area devoted to the crop as indicated by the data available was about the same as in the previous year the total production of the Northern Hemisphere was considerably higher than in 1914. According to an estimate by the International Institute of Agriculture the total production of the Northern Hemisphere, where, as shown by the average yield of the last five years, over 99 per cent of the world's barley is produced, amounted to 1,580,000,000 bushels. This yield was 13.2 per cent superior to the preceding year's production and 9 per cent above the average production for the last five years. This estimate was based on official data to the extent of 69 per cent, while the production of non-reporting countries was assumed to be the same as the average for the last four or five years. Taking the average of the quantities available during the last five years as a basis, the supply of barley produced in 1915 was regarded as ample to meet the requirements for consumption in 1915-16. The average annual value of barley and malt carried in international trade is estimated at \$220,000,000.

North America produced in 1915 about one quarter of the world's barley crop. Canada produced 50,868,000 bushels on 1,509,350 acres, an average per acre of 33.70 bushels. The United States produced 237,009,000 bushels, as estimated by the United States Department of Agriculture, on 7,395,000 acres, the average yield being 32 bushels per acre. Neither the total production nor the average yield per acre had ever been exceeded. The production was over 40,000,000 bushels greater than in 1914 and over 55,000,000 bushels in excess of the average for the five years 1909-13, and the average acre yield was over nine bushels greater than the average acre yield for this same period. The total farm value based on the average price per bushel, December 1st, and estimated at \$122,499,000, was exceeded by the value of the crop of 1911, when the price per bushel was 86.9 cents as compared with 51.7 cents on December 1st of the past year. According to an inquiry made by the United States Department of Agriculture, about 7,432,000 tons of barley straw are produced in the United States annually, and of this quantity about 60 per cent is fed to stock, 13.3 per cent is burned, 3.6 per cent sold off the farm, and 11.5 per cent plowed under.

BAROTSELAND. See **RHODESIA.**

BARREL, STANDARD. See **AGRICULTURAL LEGISLATION.**

BARRÈS, MAURICE. See **FRENCH LITERATURE, Drama.**

BARTONELLA. See **OBOYA FEVER.**

BASEBALL. The year 1915 saw the end of the baseball war which was started the year previous and which threatened to deal a severe blow to the popularity of the national game. Talk of peace began immediately after the close of the season, which had been a most disastrous

one for the owners in practically every league. Players were drawing exorbitant salaries, the fans were growing luke-warm, and gate receipts all over the country were rapidly decreasing.

The baseball magnates realized that something must be done and done quickly or financial ruin would be their portion. Informal conferences were held in various cities between the representatives of the Federal League, the trouble-maker, and the officials of so-called "organized ball," or the National and American leagues. The "peace treaty" was signed in Cincinnati, in December, although a few minor details were left for future discussion and settlement. By the terms of the agreement the Federal League passed out of existence, but some of the club owners in that organization were permitted to buy franchises in the older leagues.

The sensational feature of the year as far as the sport itself was concerned was furnished by the Philadelphia National League team led by Pat Moran. This club had been disrupted by the desertion of several of its stars to the Federal League, the year before, and in the opinion of the experts at the opening of the season could only be regarded as a tail-end team.

To the surprise of the fans and critics, however, the Phillies got off to a good start and soon built up a lead which the other clubs found it impossible to overcome. The Brooklyn Superbas made a game fight for first honors, but one disappointing Western trip in which they lost two-thirds of their games put them out of the running and the Phillies breezed through to their first pennant.

The excellent showing of the Philadelphia team was chiefly due to the consistent pitching of Alexander, the heavy hitting of Cravath and Luderus, and the sensational playing of young Bancroft at shortstop.

The American League race was the poorest in the history of that organization. At the beginning of the season it was generally conceded that only three teams had a chance for the pennant—Boston, Detroit, and Chicago—and it was in this order that these clubs finished at the top. The White Sox led the way for two months only to be overhauled by the Tigers and Red Sox in the stretch.

The battle between the Tigers and Red Sox for first place furnished little excitement. Detroit had the heavier "artillery," but Boston more than offset this with the strength of its pitching staff.

The contest for the laurels in the Federal League was much closer than in either of the two older bodies. Chicago, St. Louis, and Pittsburgh came down to the last two weeks of play neck and neck, the Whales finally capturing the flag by a one-point margin. The Federal League challenged the American and National league pennant winners to play games for the world's championship, but organized ball turned down the defl.

The World's Series therefore was contested by Philadelphia for the National League and Boston for the American League. The Red Sox were the natural favorites, the only hope of the Phillies resting in the batting of Cravath and Luderus and the pitching of the great Alexander. These men, save for Luderus, failed to come up to expectations and the well-balanced Boston team had a walkover, winning four of the five games played.

The scores of these contests follow:

Boston, 1, Philadelphia, 3; Boston, 2, Philadelphia, 1; Boston, 2, Philadelphia, 1; Boston, 2, Philadelphia, 1; Boston, 5, Philadelphia, 4.

The composite score of the five games gave Boston a batting average of .264 and a fielding average of .980 as against a batting average of .182 for Philadelphia and a fielding average of .981. The paid attendance was 143,351 and the receipts, \$320,361.50. Each winning player's share was \$3780.25 and each losing player received \$2520.17.

The leading batter in the National League was Larry Doyle of the Giants, who had an average of .320. Ty Cobb of the Detroit Tigers once again showed the way in the American League with an average of .370. Benny Kauff of the Brooklyn Tip Tops excelled with the stick in the Federal League.

Walter Johnson was the best pitcher in the American League, while in the National League Alexander of the Phillies gained the honors.

The final standing of the clubs in the National League was: Philadelphia won 90, lost 62; Boston won 83, lost 69; Brooklyn won 80, lost 72; Chicago won 73, lost 80; Pittsburgh won 73, lost 81; St. Louis won 72, lost 81; Cincinnati won 71, lost 83; New York won 69, lost 83.

The American League standing was: Boston won 101, lost 50; Detroit won 100, lost 54; Chicago won 93, lost 61; Washington won 85, lost 68; New York won 69, lost 83; St. Louis won 63, lost 91; Cleveland won 57, lost 95; Philadelphia won 43, lost 100.

The Federal League standing was: Chicago won 86, lost 66; St. Louis won 87, lost 67; Pittsburgh won 86, lost 67; Kansas City won 81, lost 72; Newark won 80, lost 72; Buffalo won 74, lost 78; Brooklyn won 70, lost 82; Baltimore won 47, lost 107.

The pennant winners in the more important minor leagues were: International, Buffalo; American Association, Minneapolis; Southern Association, New Orleans; New England, Portland; Western, Des Moines; New York State, Binghamton; Amateur, Englewood.

In college baseball Harvard, West Point, Tufts, and Brown made the best showing. Harvard won its two important series with Yale and Princeton and broke even with Brown. During the entire season Harvard won 19 games and lost only 4. The record of other leading college nines follows: Tufts won 18, lost 2; West Point won 18, lost 3; Syracuse won 18, lost 4; Brown won 17, lost 4; Lehigh won 13, lost 5; Annapolis won 16, lost 7; Columbia won 13, lost 6; Yale won 16, lost 8; Princeton won 18, lost 11; Amherst won 10, lost 9; Cornell won 12, lost 12.

BASKETBALL. The American intercollegiate basketball championship was won by Yale with nine victories and two defeats. The standing of the other teams in the league was: Cornell won 7, lost 3; Princeton won 6, lost 4; Columbia won 6, lost 4; Pennsylvania won 3, lost 7; Dartmouth won 0, lost 10. The Illinois five captured the title in the Middle Western Conference League with 11 victories and no defeats. Chicago finished second with 8 games won and 3 games lost.

The championship of the Amateur Athletic Union went to the Olympic Club team of San Francisco which defeated Whittier College of

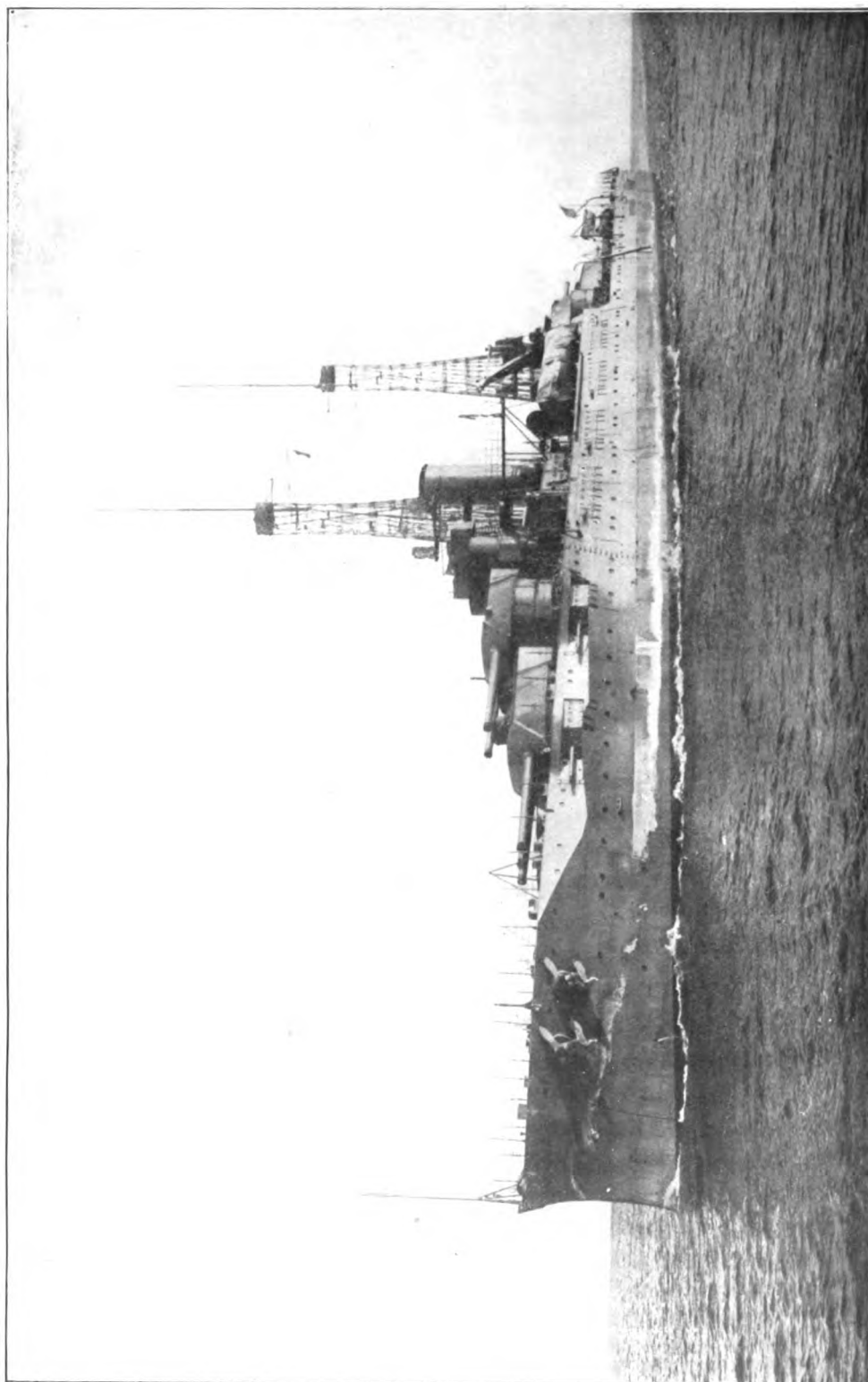
California in the final game by a score of 29 to 16.

BATES, LINDON, JR. American engineer, died May 8, 1915. He was born in Portland, Oreg., in 1883, the son of Lindon Wallace Bates, an engineer of wide reputation. Lindon Bates, Jr., was educated at Harrow, England, and at Yale University. He graduated from the latter in 1902, at once entering engineering work as vice-president to the Bates Engineering Company. He was consulting engineer for many important companies in the United States and foreign countries. In 1896 he traveled extensively in Europe, and in 1900 made an exploring expedition to the islands north of Hudson Bay. Panama, Siberia, Mongolia, Venezuela, and Brazil were also known to him as a traveler. He took an active interest in political and economic matters; was responsible for reforms in the civil service; and interested himself in direct nominations and employers' liability bills. Of the four engineers appointed by Mayor McClellan to report on a Catskill Aqueduct tunnel he was one. Two of the engineering works with which he was connected were the Galveston Sea Wall and the New York Barge Canal. His published writings include: *The Loss of Water in New York's Distribution System* (1909), *The Russian Road to China* (1910), *The Path of the Conquistadores* (1912). He also contributed on technical and economic subjects to many magazines.

BATTLESHIPS. The operations of the great war in progress in 1915 indicated during the year very little as to the requirements of battleships, for there had been no battleship actions. The battle cruiser had been definitely accepted and the armored cruiser as definitely rejected. In 1914 Rear-Admiral Sir Percy Scott of the British navy declared that "Submarines have done away with the utility of surface ships" (see YEAR BOOK for 1914, p. 92). This statement was still far from being proved. The defense against the submarine was improving rapidly—apparently much faster than the submarine itself. One point seemed quite definitely established: if a large vessel is accompanied by an adequate screen of destroyers, she is comparatively safe against the German short-range torpedo. At longer range, the submarine may have a chance, but her torpedo must be larger or carry a smaller explosive charge.

Except in the United States there was certainly a tendency to higher speed in battleships, though France and Austria were in doubt. Elsewhere the speed of the slowest battleship under consideration is 22.5 knots. The size of the heavy gun for the new ships remained as before—15 inches in England, Germany, and Italy, 14 inches in the United States, Austria, and Japan, 13.4 inches in France, and 12 inches in Russia. As Russia had laid down no capital ships for some years, there was no proof that her ideas had not changed. Italy, France, Great Britain, Austria, and the United States laid down new battleships during 1915, the displacement tonnage being given in the YEAR BOOK for 1914. The exact details of these vessels (except the American ships) will not be officially known until after the close of the war as such information is guarded carefully by the belligerents. In Russia, so far as known, no new battleships had been commenced. Since it was unlikely that they could be finished before the end of the war, no battleships not well advanced at the end of the

BATTLESHIP



Photograph by New York Shipbuilding Co.

UNITED STATES BATTLESHIP "OKLAHOMA"
On Trial Trip. Speed 21.47 Knots. Built by New York Shipbuilding Co., Camden, N. J.

year were likely to have much money spent on their construction by the Teutonic allies, as all the funds they had at disposal could be better devoted to army equipment and the completion of vessels nearly ready. This does not apply to destroyers or submarines, but neither of these could have a very great effect upon the outcome of the war.

BATTLE CRUISERS were under construction for England, Russia, Germany, and Japan, and there was reason to believe that the naval appropriation bill for 1916 would contain a provision for several for the United States navy. If built, these vessels were likely to be superior to any so far planned. The tonnage would be well over 30,000—possibly nearer 40,000—and the maximum sea speed about 35 knots. Apart from the line-of-battle, such vessels would have an extended use in warfare. They could sweep aside the cruisers, scouts, and destroyers of the enemy. Their speed makes submarine attack impossible except under most favorable circumstances. And they should be able to bring any fleeing enemy to terms by heading him off or driving in his flank. The amount of armor proposed was not stated. No battle cruisers are heavily armored; but it must not be forgotten that in every decisive battle of recent times the ships of the winning side have received few injuries; nor must we overlook Admiral Farragut's maxim that "a ship's best defense is a rapid and well-directed fire from her own guns."

BAUER, FRANCIS S. An Austrian Cardinal of the Roman Catholic Church, died Nov. 26, 1915. He was born in 1841; became a priest in 1863; was created Archbishop of Olmutz in 1904; and became a cardinal on Dec. 2, 1912.

BAUXITE. See ALUMINUM AND BAUXITE.

BEAUX-ARTS ARCHITECTS, SOCIETY OF. An association formed in New York for the education of students in architecture. The system includes the establishment in different cities of the United States of schools in which instruction in architecture may be obtained. This instruction is based upon the courses given in the Ecole des Beaux-Arts in Paris. The programme of the society is used in many universities and colleges throughout the country. The schools are formed by groups of students who wish to carry on the study of architecture, and instruction is given by a master or patron, whose work is given free. The school is supported by contributions of the students. The committee on education issues each year a certain number of programmes which include problems to be worked out by the different schools. These constitute competitions designated as Class A and Class B. During the season 1914-15 there were 978 registered students from 110 different ateliers, located in over 80 different cities in the United States and Canada. During the year 88 medals were awarded, of which 6 were first medals, 41 second medals, and 41 third medals. The society awards regular prizes—the Warren Prize for general excellence in planning a group of buildings; the Pupin Prize for decorative treatment; the Goelet Prize for excellence in planning a city block; the Bacon Prize for the greatest number of honors obtained in Class A; the Municipal Arts Society Prize for the best solution of a city-planning problem; and the Diplome Prize for added honors in Class A work.

BEEHLER, WILLIAM HENRY. American naval officer and scientist, died June 23, 1915. He was

born in Baltimore in 1848; served in the Union League Company for three weeks in defense of the city of Baltimore in 1863; graduated from the United States Naval Academy in 1868; joined the navy as an ensign in 1869, and was subsequently promoted through various ranks until he became commodore in 1907. He served with the Atlantic and Pacific fleets on various tours until 1879 when he was at the Torpedo Station. From 1885-89 he was at the office of Naval Intelligence; was appointed Chief of Ocean Meteorology of the Navy Department in 1892, serving until 1895; from 1899 to 1902 was naval attaché successively at Berlin, Rome, and Vienna; commandant of the Naval Station at Key West from 1905-10; chairman of the World's Congress of Meteorology at the Chicago Exposition in 1893; and took part in the Spanish-American War, winning two medals for service. The year 1910 saw his retirement. He invented many scientific appliances, including the solarometer (1892), an instrument for determining position and compass error at sea; and he was the author of *The Cruise of the Brooklyn* (1884), and of *The History of the Italian-Turkish War* (1912). He also contributed to magazines, chiefly on naval subjects.

BEEB. See LIQUORS.

BEE T SUGAR. See SUGAR.

BELASCO, DAVID. See DRAMA, AMERICAN AND ENGLISH.

BELGIAN CONGO. See CONGO, BELGIAN.

BELGIAN RELIEF. See RELIEF FOR WAR VICTIMS.

BELGIUM. A constitutional monarchy of western Europe, lying between France and the Netherlands and bordering on the North Sea. Capital, Brussels. During the German invasion the government was removed first to Ostend, later to Le Havre, France.

AREA AND POPULATION. The area and population by provinces, according to the census taken Dec. 31, 1910, and compared with the figures for 1831, with the number of inhabitants (density) per square kilometer in 1910, are as follows:

	Sq. km.	1831	1910	D.
Antwerp	2,832	349,942	968,677	348
Brabant	3,283	561,828	1,469,677	455
West Flanders	3,234	608,226	874,135	272
East Flanders	3,000	742,973	1,120,335	375
Hainaut	3,722	613,179	1,232,867	333
Liège	2,895	375,030	888,341	308
Limburg	2,408	160,090	275,691	116
Luxemburg	4,418	160,762	231,215	52
Namur	3,660	213,784	362,846	99

Total Belg. 29,451* 3,785,814 7,423,784† 254

* 11,371 square miles. † De jure population; de facto population, 7,416,454.

Of the total population in 1910, 3,680,790 were males and 3,742,994 were females. The census of 1900 returned 6,693,548 (3,324,834 males and 3,368,714 females); 1880, 5,520,009; 1850, 4,426,205. Since 1856 the population shows an augmentation of 63.90 per cent, a development by no means equal throughout the provinces, as shown by the following details: Antwerp, 122.95 per cent; Brabant, 96.26; West Flanders, 39.88; East Flanders, 44.19; Hainaut, 60.31; Liège, 76.38; Limburg, 43.81; Luxemburg, 19.33; Namur, 26.79. In the table below will be seen the population of 1900, the population of 1910, the augmentation during the decade due to ex-

cess of births over deaths, and that due to excess of immigration over emigration for the kingdom, by provinces (+ = excess of immigration, — = excess of emigration):

	1900	1910	Ex. Births	Ex. Immigration
Antwerp	819,159	968,677	137,121 +	12,897
Brabant	1,268,535	1,469,677	122,357 +	88,785
W. Flanders	805,236	874,135	105,206 —	36,307
E. Flanders	1,029,971	1,120,385	180,091 —	89,727
Hainaut	1,142,954	1,232,867	78,161 +	11,752
Liège	826,175	888,841	60,537 +	1,629
Limburg	240,796	275,691	48,027 —	8,132
Luxemburg	219,210	231,215	19,596 —	7,591
Namur	846,512	862,846	21,467 —	5,133
Belgium	6,693,548	7,423,784	717,563 +	12,673

The population of Antwerp as calculated Dec. 31, 1911, was 308,618 (with suburbs, 407,773); Brussels, 176,947 (737,432); Liège, 167,676 (243,865); Ghent, 166,715 (211,081); Schaerbeek,* 85,399; Ixelles,* 76,405; Molenbeek-St.-Jean,* 74,857; St.-Gilles,* 66,592; Anderlecht,* 64,425; Malines, 59,191; Bruges, 53,484; Borgerhout, 50,583; Verviers, 46,485; Ostend, 42,638; Louvain, 42,307; Seraing, 41,389; Tournai, 37,198; Courtrai, 35,872; Laeken, 35,714; Alost, 35,272; St.-Nicolas, 34,881; Etterbeek, 33,779; Namur, 32,444; St.-Josse-ten-Noode, 32,282; Berchem, 30,996; Charleroi, 28,891; Uccle, 28,127; Jumet, 28,020; Mons, 27,904; Lierre, 25,985; Forest, 25,671; Roulers, 25,488. The asterisks mark faubourgs of Brussels. The four cities of Antwerp, Brussels, Ghent, and Liège, with their environs, contain 21.16 per cent of the population of the kingdom; but the appearance of urbanization induced by these figures is offset by the fact that the dependent communes cover areas with boundaries widely separated from the urban centres; within these confines are areas devoted to agriculture.

Of the total population in 1910, 2,833,334 spoke French only, 3,220,662 Flemish only, 31,413 German only, 871,288 French and Flemish, 74,993 French and German, 8652 Flemish and German, and 52,547 all three languages. In addition there were 330,893 inhabitants, including children over two years, speaking no one of the three languages. The number of marriages in 1912 was 61,278; births, 171,187; deaths, 112,378; still births, 7789; immigrants, 42,980; emigrants, 35,775.

EDUCATION. In 1910 there were 7525 public primary schools (21,313 teachers and 929,347 pupils), 54 primary normal schools (4725 students), 4722 schools for adults (240,019 scholars), 3112 infant schools (271,237 children). There were 7590 public primary schools in 1911, with 934,830 pupils; 3186 infant schools with 275,911; 4940 adult primary schools, with 246,292; 57 primary normal schools, with 4967. There are both state and private secondary schools, and special, technical, and fine arts institutions. University population: Ghent, 1178; Liège, 2790; Brussels, 1318; Louvain, 2600—total, 7880.

AGRICULTURE. Under cultivation in the kingdom are 2,607,514 hectares (including 721,938 fallow, under brush, and otherwise irregularly productive), of which 1,818,156 under sown crops and grasses, and 67,419 under orchards, gardens, vineyards, etc. The following table gives areas planted to main crops in hectares, the production in metric quintals, and the average yield per hectare in 1913-14:

	Hectares		Quintals		Qs. per ha.
	1913-14	1912-13	1913-14	1912-13	
Wheat	159,494	161,817	4,019,505	3,802,699	25.2
Rye	84,033	84,123	918,088	921,321	27.0
Barley	271,694	277,694	6,960,945	7,220,044	25.6
Oats	28,133	28,133	98,2367	98,2367	4.2
Beets	52,419	52,588	18,919,175	18,919,175	265.5
Tobacco	4,028	4,172	89,369	89,369	22.2

* Sugar beets. † Seed; fibre production, 178,884, quintals.

Estimated number of cattle Dec. 31, 1909, 1,856,833; horses, 255,229; swine, 1,116,500. In 1913 there were 267,160 horses, 1,894,484 cattle, 1,412,293 swine.

MINING AND METALS, ETC. Number of quarries in operation in 1910, 1622, with 35,711 employees; value of products, 66,418,720 francs. In 1912, 1550, with 35,532 employees; value of products, 69,758,300 francs. Coal mines, 1910, 133 (143,701 employees); 23,916,560 metric tons, valued at 348,877,000 francs (14.59 francs per ton). In 1911, 216 mines, of which 127 in operation; output, 23,053,540 tons, valued at 340,279,000 francs. Value of iron ore 1910, 566,950 francs; blende, 139,600 francs; galena, 26,450 francs. Furnace products, 1,852,090 metric tons, valued at 120,161,000 francs; manufactured iron, 299,500 tons, 39,494,000 francs; cast steel ingots, 1,892,160 tons, 161,606,000 francs; worked steel ingots, blooms, and billets, 1,074,210 tons, 98,634,000 francs; finished steel, 1,534,550 tons, 192,220,000 francs; zinc ingots, 181,745 tons, 103,541,000 francs; pig lead, 40,715 tons, 13,464,000 francs; silver from lead, 264,655 kilos, 27,754,000 francs. Value of iron ore 1911, 766,400 francs; blende, 14,250 francs; pig iron, 1912, 160,000,000 francs; manufactured iron, 40,025,000 francs; steel ingots, 242,377,000 francs; steel rails, etc., 257,819,000 francs.

OTHER INDUSTRIES. Manufacturing industries according to the industrial census of 1896 numbered 337,395 enterprises and branches. Of these, 236,000 were permanent establishments, distributed as follows: 165,000 (70.08 per cent) home industries employing no work people; 54,500 (24.09) small enterprises employing one to four workers; 14,800 (5.12) establishments employing 5 to 49 workers; 1500 (0.63) establishments employing 50 to 449 workers; 200 (0.08) great industries employing 500 or more workers. The census returned 169,778 persons engaged in the textile industry, 137,966 in clothing factories, 134,333 in metal works, 128,313 in mines, 93,577 in construction work, 90,443 in factories for the manufacture of foodstuffs, 88,457 in timber and allied industries, and 57,702 in leather factories. There were in operation in 1911, 89 sugar works, output 234,764 tons of raw sugar; 21 sugar refineries, output 121,226 tons; 125 distilleries, output 73,864 kilolitres of alcohol at 50° G.L.; output of the breweries was 1,703,159 kilolitres; of the tobacco manufacturing, 10,141 tons. The fisheries products for 1911 were valued at 6,381,939 francs. The output of the glass factories (1900) was valued at 65,912,000 francs. The number of strikes in 1911 was 156, involving 54,947 strikers; 1906-10, 756, involving 121,416; 1901-05, 474, involving 149,987.

COMMERCE. The table below gives a résumé (in millions of francs) of the trade during the last years of four decades:

	1880	1890	1900	1910
Imports, general...	2,710.4	8,189.2	3,594.4	6,551.7
Imports, special...	1,680.9	1,672.1	2,215.8	4,265.0
Exports, general...	2,225.2	2,948.1	3,297.5	5,694.6
Exports, special...	1,216.7	1,437.0	1,922.9	3,407.4

Imports for consumption and exports of domestic produce are shown in the table below, together with transit trade, for successive years, in thousands of francs.

	1906	1910	1911	1912
Imports	3,454,000	4,265,000	4,508,500	4,958,000
Exports	2,793,800	3,407,400	3,580,300	3,951,500
Transit	2,268,800	2,287,200	2,298,900	2,437,300

Imports and exports in the special trade are given in part in the table below for 1913:

Imports	1913	Exports	1913
Wool	410,198	Wool	350,497
Wheat	398,186	Flax	132,823
Cotton	210,420	Flax yarns	114,402
Lead	29,067	Zinc	98,499
Raw hides	189,156	Raw hides	112,384
Coal	161,957	Vehicles	84,884
Corn	110,425	Rubber	109,249
Rubber	145,235	Iron and steel	251,815
Flax	100,673	Wheat	78,126
Beer	18,078	Coal	90,220
Barley, etc.	73,018	Cotton	84,848
Coffee	92,830	Vegetable oil	31,206
Seeds	172,725	Copper	32,771
Wood	124,505	Machinery	77,112
Jute	14,673	Oil cloth	2,854
Pig iron	43,323	Window glass	45,741
Machinery	107,036	Dyes and colors	68,127
Oil cake	56,309	Corn	24,880
Copper	42,032	Lead	34,712
Chem. prod.	141,696	Horses	40,894
Petroleum	42,108	Wool yarns	65,092
Dyes	65,289	Chemical products	93,601
Wine	40,842	Paper	87,288

A few of the important imports, with values in thousands of francs in 1910, follow: cereals, etc. (582,666); wool and woolens (442,139); minerals (197,462); seeds (171,178); timber (150,494); cotton, etc. (148,489); flax, etc. (143,034); raw hides (139,296); coal (107,478); rough diamonds (98,447); resins, etc. (96,301); iron ore, etc. (92,520); machinery (80,458); dyes, etc. (68,213); coffee (63,699); live animals (53,334). Exports: wool, yard, and manufactures (436,450); iron and steel (224,287); machinery, etc. (180,762); cereals (163,170); raw flax (121,136); vegetable fibre, yarn, and manufactures (113,439); seeds (111,509); cut diamonds (99,057); zinc (91,960); raw hides (91,441); coal (88,636); paints, etc. (85,087); glass and glassware (84,406); cotton manufactures (78,478); resins, etc. (53,010); manures (50,277); sugar (45,151); live animals (42,647).

Some of the principal countries of origin and destination are given below, with value of their trade in thousands of francs for two years:

	1912	1911	1912	1911
	Imports		Exports	
France	738,761	908,048	695,105	752,314
United States	341,423	413,829	113,982	145,128
United King.	486,220	505,646	498,187	594,625
Netherlands	298,217	356,573	852,846	867,599
Germany	602,398	703,120	959,331	1,007,469
British India	267,614	249,551	34,967	40,389
Russia	318,186	272,327	66,904	83,496
Rumania	245,289	200,962	24,283	17,771

In 1910, France furnished imports to the value of 747.2 millions of francs and received exports

valued at 669.1 millions; Germany, 576.1 and 881.4; Great Britain, 516.8 and 457.6; Russia, 364.1 and 67.0; Netherlands, 293.1 and 327.9; Argentina, 278.1 and 128.6; United States, 231.2 and 117.1.

COMMUNICATIONS. Railway in operation, Dec. 31, 1910, by the state, 4330 kilometers (of which 4072 state owned); by companies, 349—a total length of 4679 kilometers throughout the kingdom. At the end of 1912 there were 4719 kilometers of railway in operation, of which 4369 were operated by the state. Local lines, 3855 kilometers. The Belgian railway lines, as a result of the German invasion, came into the possession of the German authorities and were operated by them regularly after November, 1914.

Soon after the military occupation of Belgium by the Germans the permanent way over a large amount of Belgian railway was removed, and this led to a protest to the neutral states by the Belgian government, which claimed that the proceeding would hamper the trade business of the kingdom and was a violation of the laws and customs of war. Furthermore, as an incident of the military operations, a comprehensive network of light railways was constructed in Belgium, as well as in the occupied district of France, so as to relieve the pressure on the highways and release cars for service in the Eastern campaigns. A uniform method of construction was employed, involving light rails of high grade steel, laid on steel ties, and built up in sections so they could be laid very rapidly, four railway battalions being able to lay 70 miles of track in two weeks. Track laying on level ground was in some cases carried forward at the rate of 10 miles a day, or the equivalent of the daily average advance of an army. These railways were narrow gauge, but the passenger cars seated five people on a side.

In the summer the construction of a new railway line between Aix-la-Chapelle and Brussels, via Vise, was begun by the Germans and workmen were busy day and night. This involved the building of a new bridge near Lische. The new railway through Belgium was to be an almost straight line, without regard to private property or natural obstacles, as the German authorities considered such a railway of the greatest importance, not only for immediate service but for the future. It was also proposed to double track the line from Selzaete to Moerbeke and probably also the Selzaete-Ecclloo-Bruges line.

There were 7975 kilometers of telegraph lines and 43,547 of wires; in addition, there were 520 kilometers of wires installed at the expense of private railway companies. There were 1659 telegraph stations. Urban telephone wires, 233,086 kilometers; interurban wires, 29,434. Post offices, 1708. The merchant marine included at the end of 1912, 97 steamers of 174,021 tons and eight sailing vessels, of 7616 tons. Vessels entered in the 1912 trade, 11,230, of 16,353,933 tons; cleared, 11,214, of 16,319,056 tons.

FINANCE. The franc (worth 19.295 cents) is the unit of value. The table of revenue and expenditure below is in thousands of francs and includes loans (1912 budget):

	1835	1900	1909	1912
Rev. ordinary	89,171	494,106	645,107	703,883*
Rev. extraordinary	1,904	48,672	150,109	.....
Total	91,075	542,778	795,216	.....

	1835	1900	1909	1912
Exp. ordinary	85,614	479,056	634,450	708,081†
Exp. extraordinary	1,490	95,102	151,747	.....
Total	87,104	574,158	786,197	.....

* Direct taxes, 73,166,000 francs; customs, 57,803,650; excise, 81,138,300; registration, 77,253,000; revenue-earning administrations, 371,925,730; domains, dividends, interest, etc., 31,635,090; repayments, etc., 8,458,324.

† Service of the debt, 198,711,930; civil list, 5,479,090; justice, 30,636,400; foreign affairs, 4,990,846; interior, 7,792,915; sciences and arts, 40,679,402; colonies, 1,262,700; industry and labor, 26,764,217; railways, posts, telegraphs, 255,728,463; war, 67,976,440; gendarmerie, 10,379,460; finance, 24,385,900; agriculture and public works, 30,446,746; repayments, etc., 2,826,000.

The 1914 budget is detailed as follows, in thousands of francs: Revenue—property taxes, 30,362; personal taxes, 27,257; trade licenses, 9500; tax on incomes, 18,000; motor cars, 1500; cinemas, 500; mines, 29; customs, 72,031; excise, 94,703; various, 1652; registration, etc., 49,100; succession, 32,100; stamps, 14,500; fines, etc., 3013; rivers, etc., 3690; railways, 362,300; telegraph and telephone, 23,535; post offices, 27,950; steamboats, 2210; domains, etc., 5590; various, 28,179; repayments, 9609;—total, 807,313. Expenditure—public debt, 217,503; civil list, dotations, 5614; justice, 32,248; foreign affairs, 5127; interior, 7979; sciences and arts, 43,179; industry, 26,873; railways, 246,484; marine, posts, telegraphs, 54,693; war and gendarmerie, 101,096; finance, 26,544; public works and agriculture, 35,139; colonies, 1443; repayments, etc., 2826; total, 806,754.

The total consolidated debt in 1835 was 96,841,080 francs; in 1870, 682,880,914; in 1900, 2,650,898,151; in 1910, 3,703,403,693; on Jan. 1, 1912, the total consolidated debt was 3,734,354,038; on Jan. 1, 1913, 3,739,133,738 francs—219,959,632 francs share of the Netherlands debt at 2½ per cent, and 3,519,174,106 francs loans at 3 per cent. The greater part of the debt was raised for public works, and the interest is more than covered by the revenue from railways alone.

ARMY. With the defeat of the Belgian army and the retreat from Antwerp the forces became disorganized temporarily, yet they gradually came together and the army was increased and reorganized so that it was able to take up a position of defense on the banks of the Yser and became a formidable part of the allied troops. This army was fully armed and equipped and so augmented by volunteers not only from the conquered Belgian provinces, but also by refugees who had gone to England and France at the outbreak of the war. Special training camps were formed in different parts of France where these men were fully trained before they were sent to the front. It was reported that the Belgian army was really increased and with the large number of volunteers enlisted at the training camps it was stated that at the end of the year 1915 this army was greater than ever previously. At the temporary capital of the kingdom at Havre, France, a law was passed providing for compulsory general service which exempted married men and included single men up to the age of 25. No such measure apparently was needed for enlistment was general among the available Belgians. Adequate arms and equipment were provided for this Belgian army, especially for those in the trenches, so that as a fighting force it was in far better shape than it had been to resist the invasion.

GOVERNMENT. The King is the executive, assisted by a ministry of eight members, responsible to a chamber of representatives and appointed by the King. The legislative power is exercised conjointly by the King and a Parliament made up of two houses—a Senate and an elective Chamber of Representatives. The reigning sovereign during the German invasion was Albert, son of the late Prince Philippe of Saxe-Coburg and Gotha, born 1875. Prince Leopold (born 1901) is heir-apparent.

HISTORY

RESTORATION AND RELIEF WORK. The War Relief Commission sent to Belgium in November, 1914, by the Rockefeller Foundation, issued a notable report, Feb. 15, 1915, describing the condition of Belgium, and emphasizing the fact that the chief cause of misery was the sudden suspension of the nation's economic activities. "Essentially the problem is not one of repair, but of liberation. If the paralyzing restrictions imposed by the war were removed to-day, the country would rebound from its helpless inertia tomorrow, resume most of its normal occupations, and soon be able to feed, shelter, and clothe its own sufferers." One of the most serious problems, the report explained, was the destruction of live stock throughout the country, and the unwillingness of the peasants to keep horses and cattle because of the fear that the animals would be requisitioned by the German military authorities. In February an organized effort was begun by the Central Committee for the Agricultural Restoration of Belgium and Northern France to collect seed, stock, etc., to repair the ravages of war. According to the Committee's statement the loss sustained by the rural districts of Belgium aggregated \$280,000,000; of the total loss, the destruction of crops and stock represented more than half. The Belgian and French Ministers of Agriculture accepted proposals made by the Committee to undertake the distribution of gifts to the agricultural laborers of Belgium and France. The International Garden Cities and Town Planning Association in its world-wide conference at London, about the middle of February, suggested a comprehensive scheme, which received the official approval of the French and Belgian governments, for the rebuilding of the country after the conclusion of the war. A unique proposal for the restoration of Belgium was that made by Mr. John Wanamaker, the wealthy American merchant; Mr. Wanamaker proposed that the United States should purchase Belgium from the German government, paying as high a price as \$100,000,000,000 if necessary, in order that American philanthropy might conduct the work of restoring peace and prosperity to the desolate nation. Meanwhile an immense amount of practical relief work was actually being accomplished in Belgium, partly upon the initiative of the German administrative authorities, as will presently appear, and partly by the Commission for Relief in Belgium, which was generously supported by contributions from Belgium and from abroad. The Commission's report, published early in September, recorded the collection and disbursement of fifty million dollars. More than half of the money contributions were made by the Belgians themselves. About six million dollars had been contributed by the United States, in the form of

money, clothes, and food. The German government, it may be noted in this connection, had promised safe conduct to American vessels laden with supplies for the relief of Belgium. The report of the Commission furthermore revealed the fact that in June, 1915, about 2,750,000 Belgians were destitute, and were being supplied with food and clothing in so far as the Commission's resources would permit. Unemployment and destitution were steadily increasing, and the prospects for the future were indeed gloomy. A report of the Rockefeller Foundation, published about the same time as the Relief Commission's report, showed that the expenditure of the Foundation for relief purposes in Belgium had amounted to \$986,000, and that a number of Belgian scientists, formerly professors at Louvain, were receiving moderate stipends to allow them to continue their scientific work in England or America.

THE GERMAN ADMINISTRATION IN BELGIUM. Three features of the German administration in Belgium were specially worthy of note. In the first place, the German Governor-General, General von Bissing, was chiefly anxious to maintain order and discipline—no easy task with a people whose hearts had recently been inflamed by their heroic struggle against the German invader, and whose detestation of "Prussian militarism" and bureaucracy had been raised to the pitch of passion. In consequence, General von Bissing deemed it necessary to employ harsh measures. Each community was held collectively responsible for any disturbance which might occur within its midst, and the fearful punishment which had been meted out to Belgian towns during the German invasion made "collective responsibility" no empty phrase. It is interesting to note that the submissiveness shown by the conquered Belgian population in 1915 was ascribed in German circles to the salutary effect of the stern measures of the preceding autumn, which had struck terror into the hearts of the people. In three separate paragraphs under this article will be found a discussion of the *Treatment of Cardinal Mercier*, the *Case of Miss Cavell*, and the *Bryce Report*, all of which have some bearing upon the disciplinary measures employed by the Germans in Belgium. A second noteworthy feature of the German administration was the endeavor of the German officials generally to coöperate with the various philanthropic organizations for the relief of the distressed population. In March General von Bissing announced that he was doing all in his power to strengthen local self-government and social welfare institutions in Belgium, that the return of immigrants was being encouraged, and that the German Red Cross had been asked to take preventive action against prostitution, infant mortality, and contagious diseases within the country. In April a credit bank was instituted to make cash advances on the requisitions which were being given by the Germans in payment for large quantities of goods then being seized. The refusal of the Belgian Red Cross in the middle of April to enter into a systematic plan for relieving the distress in Belgium brought about the dissolution of the society by decree of the Governor-General, and the appointment of a German officer to supervise the work. In July announcement was made that the American Commission for Relief in

Belgium had concluded an agreement with General von Bissing, whereby all of the wheat and rye crops in the zone occupied by the Germans should be reserved for the needs of the civilian population. Only West Flanders and a part of East Flanders, for obvious reasons, were excluded from this agreement. Ordinarily the crops would be sufficient to supply the country for two months, but with economical use, and with the bountiful supply of seed by the American Commission, Belgium's stock of cereals was expected to last much longer. In the middle of October the Chief of the German Army Staff announced that arrangements had been made to provision 2,000,000 civilians in East and West Flanders. The authorities requisitioned a portion of the cereal and root crops in those provinces, leaving the remainder to be distributed by the American Commission. The Commission undertook to import wheat to supply the deficit, and also to supply bacon, rice, lard, and fodder, for the use of the Belgian civilian population. The third feature of the German administration in Belgium was the attempt to put the occupation of Belgium upon a self-supporting if not a profitable basis. The levy of a heavy tax on absentee (emigrant) landlords, announced in January, and the imposition of a monthly war contribution of 40,000,000 francs, announced November 13, to become effective in December, were calculated to help defray the actual cost of administration. Even more important were the measures taken to make Belgium's industrial resources valuable to Germany. From the formal statement issued March 5, by the Belgian legation at London, the fact appears that more than \$3,000,000 worth of Belgian machinery had been seized by the Germans. In order that there might be a plentiful supply of labor for the construction of arsenals, the operation of mines, and the repair of railroads, General von Bissing issued a decree imposing penalties on Belgians who refused without good reason to resume work in consonance with their former professional training. Any attempt, whether by means of threats, persuasion, or coercion, to hinder persons working for the German authorities, would be severely punished. Destitution itself, if due to stubborn refusal to work, would be treated as a misdemeanor. Furthermore, in order to promote the sale of German manufactures in Belgium, penalties were promulgated against any Belgian who should conspire with others to boycott German goods, or to threaten, blacklist, boycott, or insult users of German goods. For such offenses the penalties might be, at the maximum, two years' imprisonment and a fine of 10,000 marks.

THE GERMAN CHANCELLOR'S STATEMENT. The result of more than a year of German administration in Belgium was strikingly summarized, from the German point of view, by Imperial Chancellor von Bethmann-Hollweg, in his historic Reichstag speech of Dec. 9, 1915:

"In Belgium the economic situation is almost normal. Industry and commerce have been reinvigorated, monetary matters have been regulated, the post office, railways, shipping, and roads are working, the production of coal is rapidly increasing, and last quarter reached nearly three and a half millions of tons. Unemployment is being checked, but it is impossible to bring the labor market to a normal state

because Great Britain is strangling Belgian industry by closing its oversea export. A general obligation to visit schools for instruction in the Flemish language has been introduced."

THE TREATMENT OF CARDINAL MERCIER. Of the several instances of arbitrary conduct on the part of German officials in Belgium, in consequence of which bitter reproaches were directed against the German government by the press of allied and neutral countries, the case of Cardinal Mercier attracted the most general attention, partly because of his conspicuous position, as Cardinal Archbishop of Malines, and Roman Catholic Primate of Belgium, partly because of the high esteem in which he was held by the Belgian people. A trip through Belgium late in the preceding year so deeply touched the heart of the prelate that, in January, 1915, he was moved to write a pastoral letter on the condition of Belgium. The letter was appointed to be read in all the churches of his diocese on Sunday, January 3. Having learned of the cardinal's action, and being informed that the letter was anti-German in tone, the German authorities attempted by force to seize as many as possible of the copies which had been sent to the parish priests. At the same time Cardinal Mercier was made practically a prisoner within the confines of Malines by the authorities, who kept several officers near him at all times. Early reports stated that the cardinal was in actual confinement, but this the German authorities denied, stating at the time that he had merely been requested by the Governor of Malines not to take an attitude which might incite the people to disturb public order. On January 12 King Albert of Belgium sent a personal protestation to Rome asking that the Vatican take action against the incarceration of the cardinal. In a letter which appeared in the newspapers on January 19, the cardinal protested against the action of the authorities, and stated that he was being prevented from traveling freely, notwithstanding the German communication "that the Cardinal Archbishop of Malines has been in no wise hindered in the exercise of his episcopal duties." In answer to a remonstrance from the Holy See the German authorities in the middle of February announced the withdrawal of restrictions upon the cardinal's freedom of communication with the bishops and other clergy of Belgium. The pastoral letter of January 3, which had caused all the trouble, contained the following statement which the Germans considered provocative:

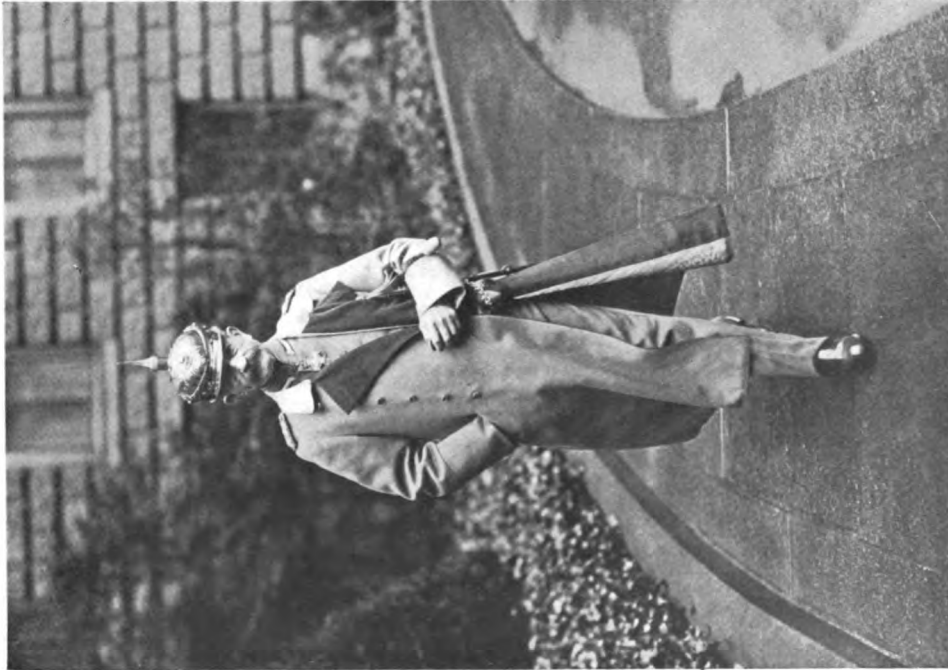
"I have gone through most of the places in my diocese which have been wasted. . . . What I have seen of the ruins and the ashes passes anything that, in spite of my most acute fears, I could ever have imagined. . . . Churches, schools, charitable institutions, hospitals, convents, to a considerable number, are unfit for use or are in ruins. Whole villages have almost disappeared. . . . God will save Belgium, my brothers, we cannot doubt it. Let us say, rather, He is saving her. . . . Is there a single patriot who does not feel that glory has come to Belgium? Which of us would have the courage to tear out the last page of our history? Which of us can look without pride on the splendor of the glory that our murdered country has won?"

THE BRYCE REPORT. Full details of the

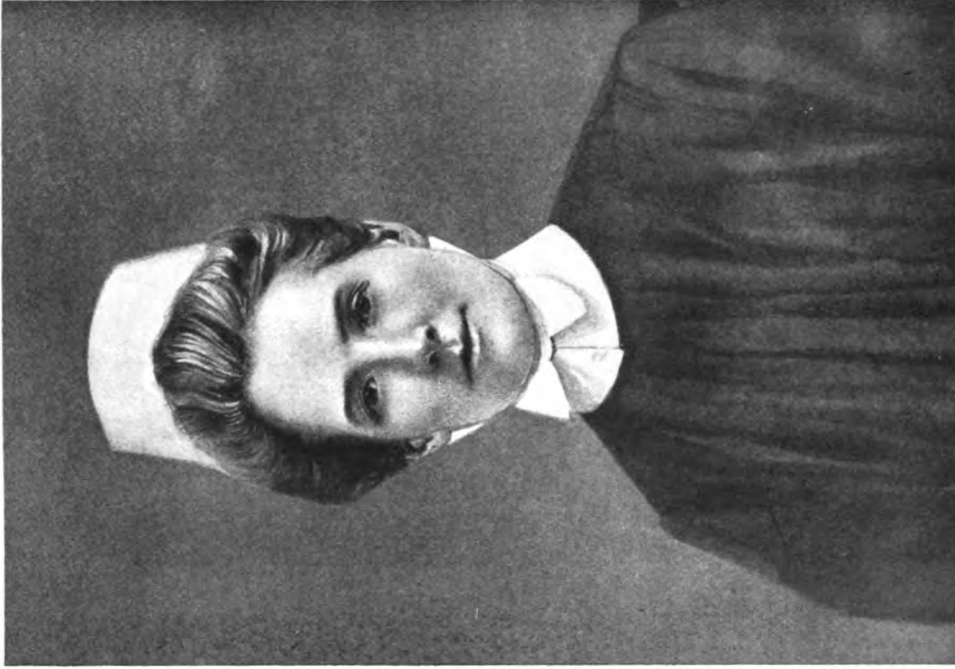
shocking outrages alleged to have been perpetrated by the German army during the invasion of Belgium were published in the Bryce Report, May 12, 1915, as the result of a careful investigation conducted by a commission of eminent British jurists under the chairmanship of Viscount Bryce. From the evidence accumulated the commission reached the conclusion that (1) the German troops in many parts of Belgium deliberately organized systematic massacres of the civilian population, and in other places committed isolated murders and outrages; (2) that outrages upon women, the killing of children, and the butchery of innocent civilians attended the progress of the German invasion quite generally; (3) that the destruction of private property and the burning of private houses was not only permitted by the German officers, but in some cases actually ordered by them, careful provision having been made in advance for the incendiaryism which the German troops practiced as part of their campaign of terrorism; (4) that the German troops by interposing civilians between themselves and the enemy's fire, by killing wounded and prisoners, and by abusing the Red Cross, had flagrantly violated the rules and usages of civilized warfare. As a counterblast to the Bryce Report, the German government published a memorandum specifying in detail, with the names of witnesses, the acts of the civilian population—such as throwing boiling water, "sniping off" soldiers, maiming wounded Germans, and murdering officers—which led to the punishment of Belgian towns, including Louvain. Furthermore, the German apologists were supplied with additional material for the justification of Germany by the discovery of secret Belgian diplomatic documents, which, it was claimed, proved that Belgium's fate was deserved, inasmuch as her neutrality had already been surrendered to England.

THE CASE OF EDITH CAVELL. In October, 1915, a new "German atrocity" in Belgium aroused the British public to furious indignation and, to a lesser degree, the public of neutral countries. According to the account of the affair sent by the American minister, Brand Whitlock, to London, and published by the British government, Miss Edith Cavell, an Englishwoman who had been in charge of a training school in Brussels, was accused of utilizing her position as a nurse to assist in the escape of British, Belgian, and French soldiers from Belgium. She had been arrested August 5th; October 11th she was condemned to be executed by a firing squad of German soldiers. Disliking to kill a woman in cold blood, the firing squad had aimed so inaccurately that Miss Cavell was not killed, but only wounded by a single bullet. Thereupon—and this was the circumstance which particularly infuriated the British press—the German officer in charge of the firing squad drew his revolver, put it up to the woman's ear, and deliberately pulled the trigger. In England Miss Cavell was henceforth regarded as a martyr, a sort of British Joan of Arc. A memorial service at Westminster Abbey, attended by Mr. Asquith as well as by representatives of the royal family, was thronged by a vast multitude anxious to do her honor. Plans were made to erect a statue to her memory.

BELGIAN ROYAL FAMILY. Early in April,



Photograph by Paul Thompson
GENERAL VON BISSING
Military Governor of Belgium



EDITH CAVELL
The English Nurse Executed as a Spy at Brussels, October 12, 1915

Prince Leopold, thirteen and a half years of age, the youngest son of the King and Queen, enlisted in the war. He joined a famous regiment of the line noted for its heroic defense of Dixmude. On April 8th King Albert celebrated his fortieth birthday among the ruined towns of Flanders, all that remained of his kingdom. Among others, President Woodrow Wilson sent His Majesty greetings on the occasion. Late in May the King conferred the Grand Cordon of the Order of Leopold on Field Marshal Lord Kitchener, British Secretary of State for War.

RELATIONS WITH THE VATICAN. On March 17th Baron van den Heuvel, the Belgian Minister to the Vatican, presented his compliments to the Pope. Pope Benedict, in answering the Baron, referred to the protests which the fate of Belgium already had drawn from him in his Consistorial Allocution of January 22nd, and continued:

"We wish that our dear Belgian children may soon salute the beautiful sun of peace on the horizon of their country. We even desire not to limit ourselves to mere wishes, but for the moment we ask the Belgians not to doubt the benevolence with which we love to surround them."

MILITARY OPERATIONS IN BELGIUM, see article **WAR OF THE NATIONS**, *passim*.

BELGIUM, COMMISSION FOR RELIEF IN. See **BELGIUM**; and **RELIEF FOR WAR VICTIMS**.

BENEFACCTIONS. See **CHARITIES**.

BENNETT, ARNOLD. See **LITERATURE, ENGLISH AND AMERICAN, Fiction**.

BENSON, RICHARD MEUX. A Church of England clergyman, died Jan. 14, 1915. He was educated at Christ's Church College, Oxford, and was ordained priest in 1849. In 1850-70 he was vicar of Cowley, and from 1870-76 vicar at Cowley-St. John. The founder of the Society of St. John the Evangelist, commonly called the Cowley Fathers, he became its first Superior. His published writings include: *The Wisdom of the Son of David*; *The Final Passover*; *The Life Beyond the Grave*; *War Songs of the Prince of Peace*; and *St. Columba*, a poem.

BERCHTOLD, COUNT. See **AUSTRIA-HUNGARY, History**.

BEREA COLLEGE. An institution for higher education, founded in 1845, at Berea, Ky. The total enrollment in all departments in the autumn of 1915 was 1262. The faculty numbered 95. There were no notable changes in the membership of the faculty during the year, and no noteworthy benefactions were received. The college has an endowment of about \$1,000,000, and a total income of about \$118,000 per year. The library contains 30,000 volumes. The president is William G. Frost, Ph.D., D.D.

BERIBERI. No new theories concerning this disease have been put forward during the past year. An interesting incident which supports the dietary theory was the arrival of a German war vessel, *Kronprinz Wilhelm*, which put into an American port after a cruise of 255 days. A large number of the crew were found by the United States Public Health Service to be suffering from beriberi, and inquiry into their diet revealed the fact that foods having the bases of lime were markedly deficient, fresh meat, white flour, bread and crackers, boiled potatoes, butter, lard, and sugar being the chief articles of food. It is notable that 47 cases

were cured in eight days after a change was made to a diet rich in alkaline ash.

BERMUDA. A group of islands (about 300) lying about 500 miles to the east of Cape Hatteras; a British colony. Area, about 19 square miles; population (1911 census), 18,994 (12,303 colored). Hamilton (the capital) had 2627 inhabitants; St. George's, 1079. During the year ended May, 1912, about 20,000 tourists entered the colony. The mild, equable climate has long made the islands a favorite winter resort. Nearly three-fourths of the area is unfit for cultivation. The remainder is utilized for the production of early spring table crops, for export to the United States. There are no railways. There is a private telephone company, with about 1560 miles of wires. Commerce and finance statistics from 1910-13 are given in the following table:

	1910	1911	1912	1913
Imports	£517,074	£545,540	£637,178	£570,575
Expenditure ..	68,392	90,100	78,210	87,779
Exports	106,508	134,033	116,586	90,695
Revenue	78,593	79,248	83,629	80,576
Shipping*	688,315	700,869	1,273,666	1,255,866

* Tonnage entered and cleared.

Customs revenue (1913), £64,711. The Governor, Lieut.-Gen. Sir George Mackworth Bullock, was appointed April 4, 1912.

BERNSTORFF, COUNT VON. See **UNITED STATES AND THE WAR**.

BESSEY, CHARLES EDWIN. American botanist and educator, died Feb. 26, 1915. He was born in Milton, Wayne County, Ohio, in 1845, and graduated from the Michigan Agricultural College in 1869. In 1872 and 1873, and in 1875 and 1876 he studied at Harvard University under Dr. Asa Gray. Afterwards taking a post graduate course at the State University of Iowa, he received thence the degree of Ph.D. From 1879-84, professor of botany at the Iowa Agricultural College, he was acting president of that institution in 1882, whence he went as professor of botany to the University of Nebraska in 1884, and there, from 1888-91, he acted as chancellor of the university, as he did again from 1899-1900, and in 1907. In 1909 he was appointed dean of that institution and continued in this capacity until his death. From 1880 to 1897 he was botanical editor of the *American Naturalist*, and acted in the same capacity for *Science* from 1897 through the remainder of his life. From 1910-11 he was president of the American Association for the Advancement of Science; and he was an official or member in many other scientific societies. He received the degree of LL.D. from Iowa College in 1898. His published writings include: *Geography of Iowa* (1876); *Botany for High Schools and Colleges* (1880); *The Examination of Botany* (1884); *Elementary Botany* (1904); *Outlines of Plant Phyla* (1909, 1911, 1912, 1913). He was one of the most eminent botanists in the United States.

BETBEDER, ONOFRE. An Argentine vice admiral, died Jan. 24, 1915. He was born in 1862, and at an early age entered the naval service, after graduation from the naval academy at Buenos Aires in 1880. For two presidential terms, beginning in 1898, he was Secretary of the Navy. He was made a rear admiral in 1904. Of the Argentine commission, which since May,

1911, has been in New York City supervising the construction of two dreadnoughts for the Argentine navy, he was president. In 1912 he was made vice admiral.

BETHMANN-HOLLWEG, THEOBALD VON. See GERMANY, *History*, *passim*.

BIBLE SOCIETY, AMERICAN. The society issued during the year ending March 31, 1915, 6,406,323 volumes. Of this number, 2,426,418 were issued from the Bible House in New York, and 3,979,905 from foreign agencies of the society. The work of the society is carried on in over fifty countries, on five continents, and among the islands of seven seas. It maintains nearly 2000 distributors. An important part of its work is the revising and improving the versions of the Scripture, already published, and the translation of the Bible into new languages and dialects. Its home agency work is among the colored people of the South, and among immigrants in the Northwest, in the South Atlantic States, and in other sections. It also prosecutes work among the foreign population of New York. The distribution of the Bible in the United States in the year ending March 31, 1915, was 2,183,783 volumes. In addition, 35,000 volumes were sent to Porto Rico, Hawaii, and the Philippines. The total appropriations for foreign agencies for 1914-15 amounted to \$249,400, and for home agencies \$94,300. The ninety-ninth annual meeting of the society was held on May 13, 1915. The officers of the society are: James Wood, president; Rev. John Cox and Rev. William I. Haven, secretaries; Rev. Henry O. Dwight, recording secretary; and William Folk, treasurer.

BICYCLING. See CYCLING.

BILLIARDS AND POOL. William F. Hoppe, champion of the world at all forms of balk-line billiards, showed in 1915 that he had lost none of his amazing skill in making the ivories obey his slightest whim. In the first professional handicap tournament at 18.2 balk-line ever held in New York City, Hoppe allowed some of the most prominent players in the United States 200 points and yet went through the severe test without losing a match. Furthermore, he established a new world's record high run of 308 points in one game. Welker Cochran, of Wisconsin, finished second in this tourney, Hoppe being the only player to defeat him.

Alfredo de Oro, who regained the three-cushion title by the withdrawal of William Huey, the champion, proved himself king of this type of billiards, setting up a new world's record by running 50 points in 35 innings.

J. Mayer, of Philadelphia, won the amateur class A championship in a tournament held at Philadelphia, scoring 6 victories in 6 games. J. Poggenburg finished second with 4 games won and 2 lost.

In English billiards, Melbourne Inman, English champion, defeated John Montgomery by a score of 3000 to 605, Inman agreeing to play 3000 points against Montgomery's 1000.

J. H. Shoemaker won the amateur pool championship tournament held in New York City, making a clean sweep of the six games. E. F. Reynolds was second with 5 victories and 1 defeat.

BINDER TWINE. See AGRICULTURE.

BINGHAM, PROFESSOR. His explorations. See EXPLORATION, *South America*.

BIOGRAPHIES. See LITERATURE.

BIOLOGY. See BOTANY; and ZOÖLOGY.

BIPLANES. See AERONAUTICS.

BIRDS. See ORNITHOLOGY.

BIRTH RATE. See VITAL STATISTICS.

BJÖRNSSON'S *When the Young Vine Blooms*. See DRAMA, AMERICAN AND ENGLISH.

BLACK, JOHN CHARLES. American soldier and public officer, died Aug. 17, 1915. He was born in Lexington, Miss., in 1839, and educated at Wabash College. At the outbreak of the Civil War, enlisting as a private, on the expiration of his three months' service, he joined the thirty-seventh volunteers as a major; was promoted to be lieutenant-colonel, and to be colonel in 1862, for bravery in the battle of Prairie Cross, Ark., in which he was severely wounded. In April, 1868, at the age of twenty-six, he was brevetted brigadier-general of volunteers for gallantry in Blakley, Ala. Although his health had been undermined by severe wounds, at the close of the war he settled in Danville, Ill., to finish the study of law, and soon thereafter began to practice in that city, entering actively, also, into politics. In 1866, 1880, and 1884 he was the Democratic candidate for Congress. Nominated for lieutenant-governor in 1872, and for United States Senator in 1879, he was in both cases defeated. In 1884 he declined the nomination for Governor of Illinois. The office of commissioner of pensions, to which President Cleveland appointed him, he held for four years. From 1893-95 he was representative at large for Illinois, and from 1895-99 he was United States district attorney of the northern district of that State. Appointed civil service commissioner in 1903, he became in the following year president of the Civil Service Board, holding that office until June 10, 1913. In 1903-04 he was commander-in-chief of the Grand Army of the Republic.

BLINDNESS. See CHARITIES; TRACHOMA.

BLOCKADE CONTROVERSY. See UNITED STATES AND THE WAR.

BLUE SKY LAWS. Following extensive speculation in oil and gas stocks in 1905-10, the State of Kansas enacted a law in 1911 requiring dealers in investment securities to be licensed by the State and to file with the State Banking Department information regarding stocks and bonds sold by them. This led some 20 States to enact laws all designed to prevent the sale of fraudulent securities to an unsuspecting public. These laws are known as "blue sky" laws, owing to a remark of the Kansas bank commissioner that certain companies were capitalizing the blue sky. Owing to the extremity to which the proposed regulation was carried, the Investment Bankers' Association began a systematic effort to bring about such legislation as would not impede the operations of dealers handling legitimate stocks but would secure the punishment of fraudulent operations. This effort was seconded by the National Association of Supervisors of State Banks, which appointed a "Blue Sky Committee" in 1914, which coöperated in carrying through a less restrictive type of law. This committee drew up a model law based upon Federal postal laws and designed to make fraud punishable without introducing close supervision by an executive or commission. By the close of 1914 various of these laws had been brought before the courts to test their constitutionality. The most impor-

tant of these decisions in 1914 declared the Michigan Blue Sky Law unconstitutional, because of interference with interstate commerce and with the individual's right of free contract, and also because of an undue extension of the police power. Subsequent decisions in the case of the Iowa and West Virginia statutes and the 1915 law of South Dakota, as also in the case of the laws of Arkansas and Kansas, showed unanimity of opinion among 11 Federal judges. In a few cases the laws have been sustained either because their scope was narrow, or because the plaintiff was disqualified to bring suit. Thus the laws of Arkansas, Florida, and Montana were upheld since they applied solely to promotion and get-rich-quick concerns, and did not affect the ordinary dealer in securities. The South Dakota statute was enjoined on November 18th by the Federal Court; the constitutionality of the revised Michigan law was argued on November 13th; and at the close of the year the Ohio law was also before the court. It was expected that the South Dakota case would be appealed to the United States Supreme Court.

During 1915 bills for the enactment of some sort of Blue Sky Law were introduced into nearly every State Legislature, but no State which had not previously passed a law on this subject enacted legislation in 1915. In the following States, however, laws were reenacted or revised on account of previous judicial decisions: Arkansas, Iowa, Kansas, Michigan, North Dakota, South Dakota, and West Virginia. The new Michigan law differed immaterially from the one declared unconstitutional, and apparently is to be carried through the courts to the United States Supreme Court for the final adjudication of the principles involved.

BOARDMAN, GEORGE NYE. American theologian and educator, died Nov. 9, 1915. He was born in Pittsford, Vt., in 1825; graduated from Middlebury College in 1847, and from Andover Theological Seminary in 1852. He was ordained to the Congregational ministry in 1854. From 1853-59 he was professor of rhetoric, English literature, and sociology at Middlebury College. From 1859-71 he was pastor of the First Presbyterian Church at Binghamton, N. Y. A year later he was appointed assistant professor of systematic theology at the Chicago Theological Seminary, holding this position until 1893, when he became professor emeritus. He was the author of *Lectures on Natural Theology; The Will and Virtue; Congregationalism, A History of New England Theology*. He received honorary degrees from the University of Vermont, Lafayette College, and Middlebury College.

BOHEMIA. See AUSTRIA-HUNGARY.

BOILERS. The construction of boilers during the year 1915 involved the use of larger units, higher steam pressure, and a greater output per square foot of heating surface, without undue loss of efficiency. In fact in many plants it was realized that by improving operating conditions, better stoking, both automatic and manual, with proper records and indicators, increased economy could be secured. Larger boilers, such as units of 1200 boiler horse power capacity, were coming into service rather generally for large electric central stations. The Commonwealth Edison Company of Chicago had several with a heating surface of 12,200 square feet each, and the Connors Creek Edison station

had one with 23,650 square feet. The latter boiler was regarded as of unusual size and not likely to be duplicated soon.

With boilers designed for such service as 350 pounds pressure and 200 degrees superheat, as in the case of new units for the Public Service Company of Northern Illinois, mechanical engineers were considering the possibility of employing from 600 to 700 pounds, or even 1000 pounds per square inch pressure, and there was a general tendency to consider that the time had arrived for using high pressure in excess of the 200 pounds or so previously employed. Furthermore, there was a development in the output of steam per square foot of heating surface, evaporations of 5, 6, and 7 pounds per square foot were by no means uncommon during the year, and there were instances where this had been raised to 10, 12, 14, and even 16 pounds, with maintenance of excellent efficiency. As a result of such work and the use of economizers in connection with boilers, engineers looked for developments of noteworthy character in the near future.

Boiler explosions to the number of 1300 or 1400 occur annually in the United States, with a death roll of from 400 to 500 persons, and a list of injured of from 700 to 800, with a loss of property of over \$500,000.

The Council of the American Society of Mechanical Engineers, at a meeting held in February, 1915, approved the report of the Boiler Code Committee, which was established on Sept. 15, 1911, "to form standard specifications for the construction of steam boilers and other pressure vessels and for the care of the same in service." This committee included seven members—a consulting engineer, a former member of the Massachusetts Board of Boiler Rules, two professors in engineering, two boiler manufacturers, and one insurance engineer. The Massachusetts and Ohio rules which were considered the best in use were taken as a basis, and from these a preliminary draft was prepared and widely circulated for criticism among those directly interested. This draft received repeated revision, and practically all interests concerned, especially the boiler manufacturers, desired more stringent rules than those arranged for Massachusetts and those prepared originally by the committee.

This report and the accompanying code deals in detail with specifications for boiler steam and boiler tubes, uniform rules for safety valves, fire tube and water tube boilers, steam and hot water heating boilers. It combines practice with theory so that all interests from the manufacturer to the user are protected.

It was the design of the society that this code should form the basis for uniform State and municipal legislation, and it was adopted by the officials in charge of steam boiler inspection in the States of Ohio, Indiana, and the cities of Detroit and Chicago. In Pennsylvania, Wisconsin, and California, the State authorities expressed their satisfaction with the code and their intention to put it in force later. The American Uniform Boiler Law Society, formed of representatives of the principal trade and technical organizations that cooperated in the drafting of the code, was actively at work during the year, and bills for the adoption of the code were to be introduced in the 1915-16 sessions of the Legislatures of Georgia, Kentucky,

Louisiana, Massachusetts, New York, New Jersey, Rhode Island, South Carolina, and Virginia. In fact it was proposed to secure legal adoption for the code in all the States of the Union, as it would result in great benefits to boiler makers and users, tending toward greater safety and engineering efficiency. The committee advocating the adoption of the code contained representatives of the boiler manufacturers, the water tube manufacturers, locomotive manufacturers, steam shovel manufacturers, and hoisting engine manufacturers.

One of the notable publications of the year was a new edition of *Steam Boiler Economy*, by William Kent. This deals with the most modern practice and is considered a valuable contribution to the literature on this subject.

The number of boiler failures in the United States for the year ending June 30, 1915, was 371. In these, 127 persons were killed and 317 injured. In 107 reports of property losses the damage was estimated at \$155,325, or an average of about \$1450. In the strictly power-plant failures, 51 were due to defective tubes, 12 to cast iron headers, 23 to blow-off pipes, and 10 caused by over pressure.

BOKHARA. A Russian vassal state in central Asia. Estimated area, 83,000 square miles; estimated population, 1,500,000. Capital, Bokhara, with about 75,000 inhabitants. Other towns are: Karshi (25,000), Hissar, Khuzar, and Shahr-i-Zabz (about 10,000 each). Moham-medanism prevails. Russians in the country number upwards of 10,000. The town of Bokhara is only a few miles from the line of the Trans-Caspian Railway, which traverses the country; the length of the railway within Bokhara is 186 miles. The ameer in 1915 (from Jan. 6, 1911) was Sayid-Mir-Alim Khan.

BOLIVIA. An interior South American republic. The seat of government, executive and legislative, is La Paz, where also the members of the diplomatic corps are resident; the Supreme Court sits at Sucre.

AREA AND POPULATION. The area has been officially estimated at 1,379,014 square kilometers (532,437 square miles) or, including disputed territory, 1,458,034 square kilometers (562,047 square miles). There has long been a boundary dispute with Paraguay; in 1915 a protocol relating thereto was signed extending for one year the protocol of 1913. The population, according to the 1900 census, was 1,744,568, of whom 50.9 per cent were Indian, 26.7 mestizo, 12.7 white, 0.21 negro, and 9.4 unclassified. An estimate of the population in 1914 was 2,520,540. It is not unlikely that this figure is somewhat too large; a calculation published in 1915 was 2,492,377. The great elevated plateau of Western and Central Bolivia contains the larger part of the population, both urban and rural. Estimated population of the larger towns: La Paz, about 95,000; Cochabamba, 30,000; Sucre, Oruro, and Potosí, each about 25,000; Santa Cruz, 21,500; Tarija, 8000.

EDUCATION. There are universities at La Paz and Sucre, and secondary schools (public, private, clerical) in the larger towns; primary instruction is free and nominally compulsory, but a large part of the people are illiterate. Roman Catholicism is the established religion. By a law of 1912 marriages must be celebrated by civil authorities.

PRODUCTION AND COMMERCE. Agriculture is

important only to meet local needs and not as a factor in the foreign trade. The estimated area under cultivation is about 4,940,000 acres, producing corn, barley, rice, potatoes, beans, etc.; other products are coffee, cacao, coca, and quina. Live stock, as reported for 1912, included 98,846 horses, 44,584 mules, 172,959 asses, 734,286 cattle, 1,499,114 sheep, 467,950 goats, 414,047 llamas, 112,033 alpacas, and 114,146 swine. Large quantities of rubber are gathered in the northern forests; rubber stands next after tin in value among the exports, and in the exportation of rubber Bolivia ranks next to Brazil among South American countries. Bolivia derives its prosperity chiefly from the production of tin; it ranks second only to the Federated Malay States among the tin-producing countries of the world. Other metals produced in considerable quantity are silver, copper, bismuth, and gold.

Imports and exports have been valued as follows, in thousands of bolivianos:

	1909	1910	1911	1912	1913	1914
Imports	36,937	48,802	58,371	49,509	54,763	.....
Exports	63,764	74,567	82,631	90,123	95,722	.....

The principal imports are cotton and woolen goods, provisions, machinery and hardware, wines and spirits, and apparel. The chief exports, valued in thousands of bolivianos, were as follows in 1911 and 1912, respectively: tin, 52,640 and 60,238; rubber, 18,921 and 15,509; silver, 4588 and 4308; copper, 1427 and 3389; bismuth, 2218 and 2150; gold coin, 1297 in 1912; coca, 511 and 736; wolfram, 231 and 520; silver coin, 791 and 432. Imports from and exports to Germany in 1912 were valued at 16,514 and 11,201 thousands of bolivianos; the United Kingdom, 9070 and 66,954; the United States, 4595 and 392; Chile, 3982 and 850; Peru, 3781 and 954; Argentina, 3029 and 698; Belgium, 2571 and 3639; France, 2436 and 5472. The tin export amounted in 1912 to 38,378 metric tons; rubber, 4079; silver, 124; bismuth, 387; wolfram, 472.

COMMUNICATIONS. In the latter part of 1913, railways in operation aggregated 1292 kilometers (803 miles), distributed as follows: Antofagasta-Oruro (without branches), 922 kilometers, the Bolivian section being 482 kilometers; the branch line Uyuni-Huanchaca, 38 kilometers; Viacha-Oruro, 202 kilometers; Guaqui-La Paz, 98 kilometers; the tramways, Cochabamba-Vinto-Cliza, 57 kilometers; Río Mulatos-Potosí, 174 kilometers; Arica-Alto de La Paz, 439 kilometers, the Bolivian section being 233 kilometers; branch from this last line to Corocoro, 8 kilometers. Lines under construction aggregated 605 kilometers (376 miles). Surveys had been made for a line from Santa Cruz to the eastern frontier at Puerto Suárez (683 kilometers), and for one from Tupiza to the Argentine frontier town of La Quiaca (93 kilometers). The construction of the latter line and the completion of the line from Uyuni to Tupiza was to provide a new through rail route from the Atlantic Ocean to the Pacific. It was announced that the line from Uyuni, a station on the Antofagasta and Bolivia Railroad, which had been under construction in a southeasterly direction towards Tupiza, was to be extended to the present northern terminus to the Argentine railways at La Quiaca, on the frontier directly south of

Tupiza. Work on the proposed railway was begun during the year.

The principal line is the one extending from the Chilean port of Antofagasta to the frontier town Ollagué (440 kilometers), and thence through Uyuni, Río Mulatos, Challapata, Poopó, and Machacamarca to Oruro (482 kilometers). There is connection at Oruro for Viacha (202 kilometers), which is also on the Guaqui-La Paz line and the line from Arica; the distance from Viacha to Alto de La Paz is 23 kilometers, and thence by electric to La Paz, 8 kilometers. The distance from Viacha to Guaqui, on Lake Titicaca, is 65 kilometers. Guaqui has steamer connection with Puno, on the Peruvian shore, whence there is rail communication with the Peruvian port of Mollendo. The distance from La Paz to Mollendo is 861 kilometers, from La Paz to Arica 447 kilometers, and from La Paz to Antofagasta 1155 kilometers. These lines reach very great altitudes; for example: La Paz, 3636 meters; Alto de La Paz, 4089; Viacha, 3919; Corocoro, 4056; Oruro, 3703; Challapata, 3708; Río Mulatos, 3806; Uyuni, 3660; Ollagué, 3696; Tiahuanaco, 3825; Guaqui, 3813; and in Peru, Puno, 3814; Santa Lucía, 4038; and Crucero Alto, 4470.

There is telegraph communication with foreign countries and between the principal towns, including all the departmental capitals. The length of line in 1912 was 6133 kilometers; wire, 8951; offices, 194. The wireless telegraphy system includes stations at La Paz, Villa Beni, Trinidad, Cobija, Santa Cruz, Yacuiba, and Puerto Suárez. Post offices number about 200.

FINANCE. The standard of value is gold. The monetary unit is the boliviano, par value 38.932 cents, or 12.5 bolivianos to the pound sterling. A statement of Bolivian revenue published in 1915 showed that the revenue increased from 3,624,200 bolivianos in 1890, to 4,115,700 in 1895, 6,462,931 in 1900, 7,854,698 in 1905, 12,583,232 in 1910, 20,164,602 in 1912, and 22,018,874 in 1913. The budget for the fiscal year 1915 showed estimated revenue and expenditure of 25,263,500 and 24,630,702 bolivianos, respectively. The estimated revenue comprised: import duties, 9,975,850 bolivianos; export duties, 4,825,000; taxes, 6,753,000; other receipts, 3,709,650. The larger estimated disbursements were: for the ministry of finance, 9,369,820 bolivianos; war and colonization, 5,714,675; interior and fomento, 3,771,326; public instruction and agriculture, 2,562,468. Bolivia had no foreign debt until 1908. The foreign debt, as stated for June 30, 1913, was: 1908, 5,663,006 bolivianos; 1910, 18,218,250; 1913, 12,500,000. Internal debt, 5,298,846 bolivianos; floating, 8,100,694.

GOVERNMENT. The executive power is vested in a President who, with two Vice-Presidents, is elected by direct vote for four years, and ineligible for the next term. There is a Cabinet of six ministers. The legislative power rests with a Congress of two houses, the Senate and the Chamber of Deputies. Senators (16 in number) are elected for six years, and deputies (75) for four years, all by direct vote. The President in 1915 was Ismael Montes, who succeeded Eliodoro Villazón on Aug. 14, 1913. First Vice-President, Juan M. Saracho; second Vice-President, José Carrasco.

HISTORY. *Internal Conditions.* Bolivia, on Dec. 31, 1914, declared a 90 day moratorium, made necessary by the scarcity of money in the

country. In March the moratorium was extended till the end of December, 1915. The European war proved very disastrous for Bolivia, causing great reductions in her exports and revenues. The estimated revenues for 1915 were 16,985,000 bolivianos, or in American money, \$6,607,165, while the expenditures were estimated at 21,453,938.32 bolivianos, or \$8,345,582. This meant a deficit of more than \$1,600,000, which would have to be made up by a 30 per cent reduction of a majority of items in the budget. The announcement was made in July that Bolivia would begin to work the famous copper mines in the vicinity of Corocoro in order to supply Europe with copper bullion. These mines had been lying idle for years owing to the low-grade copper which they produced. In July the Bolivian government announced that the exports for 1914 had totaled 63,000,000 bolivianos, of which Great Britain had secured commodities worth 51,000,000 bolivianos, Germany 3,000,000, France and the United States 1,000,000 each. Early in August the permanent construction work on the railway between Quiaca and Tupiza was begun by the French company which held the contract. This railway had long been needed to facilitate international trade between Bolivia and Argentina and to give an outlet by rail from La Paz and other connecting points to Buenos Aires.

Relations with the United States. On May 14th, Bolivia negotiated a loan of \$1,000,000 through the National City Bank of New York. This loan was expected to prove of valuable assistance in overcoming financial difficulties caused by the European war. The country also took part in the Pan-American Financial Conference in May, and was one of the nations which recognized Carranza as provisional president of Mexico in October. See **INTERNATIONAL PEACE AND ARBITRATION.**

BOLL WEEVIL. See **ENTOMOLOGY.**

BONE BLACK. See **CHEMISTRY, INDUSTRIAL.**

BOOTS AND SHOES. During 1915 the boot and shoe industry, as well as the leather business generally, felt the effects of the European war. The United States exported leather to nations from whom once it had imported, while there was a great increase of export business to British colonies, South America, South Africa, East Indies, and the Dutch Indies, not to mention military shoes for the fighting armies. It was estimated at the end of the year that the United States had shipped some 15,000,000 pairs to Europe for the armies from the outbreak of the war. The boot and shoe business was somewhat dull and depressed until the last quarter of the year; nevertheless, prices for everything, from raw materials to finished products, increased. Foreign competition was largely eliminated, so that the American manufacturer was protected by a wall more effective than any tariff. One feature of the year's domestic business was the large number of styles in footwear, and these styles changed very rapidly. Considerable use was made of various kinds of cloth and of colored leathers ranging from white to bronze, blue, and other shades, for the entire shoe as well as for ornamental tops, with white being in strong demand for uppers as well as independent gaiters. The change of fashion in women's clothing, whereby short and wide skirts were adopted in the autumn of 1915, put increased emphasis on ornamental footwear, and

also had its effect on the manufacturing industry.

An important event of the year was the injunction which was issued in the United States District Court by Judge Dyer against the United Shoe Machinery Company, which prevented leasing of new machines, and made invalid leases of all machinery of the company at work in shoe factories. This injunction, however, was suspended by the United States Circuit Court somewhat later, and the issue was to be tried as an equity proceeding to determine what might be legally done under the terms of the Clayton Law.

An examination of labor conditions in the shoe factories of Massachusetts, made by the United States Bureau of Labor, and published during the year, revealed the fact that in this State some 80,000 workers were employed in the industry, or nearly half of the shoe workers in the United States. About 28,000, or about 35 per cent of this number were women, and in active periods of the industry over 40 per cent earned more than \$10 per week, being as a group the highest paid female help in industrial life. That 60 per cent earned less than \$500 a year was another finding in this investigation.

Shoe manufacturing conditions in Europe also were naturally greatly disturbed by the war. In Great Britain the tanneries were being operated by the War Office, and large numbers of boots were being turned out by the various manufacturers. Towards the close of the year the British War Office was securing bids for the Italian army. In Germany the War Leather Company regulated almost the entire hide, leather, and shoe business of Germany, and the maximum prices for these products were fixed by German authorities. In Austria government regulation was also in force, while shoe manufacturers in Hungary labored under hard conditions, as they were required to turn out monthly 80,000 pairs of military shoes to the government at prices fixed by contract, which with the prices of raw materials permitted little if any profit.

BOSNIA AND THE HERZEGOVINA.

Provinces, formerly Turkish, annexed to the Austro-Hungarian monarchy, Oct. 5, 1908. The provinces are administered by a bureau of the common Austro-Hungarian ministry of finance. There is a diet, directly elected, whose legislation is subject to Austro-Hungarian veto. The seat of local government is Sarajevo, in Bosnia. Area: Bosnia, 16,239.4 square miles; the Herzegovina, 3528.5; total, 19,767.9 (somewhat more than the combined area of New Hampshire and Vermont). Population, according to the census of Oct. 10, 1910: Bosnia, 1,631,006; the Herzegovina, 267,038; total civil population, 1,898,044; in addition, military population, 33,785; total, 1,931,802, as compared with 1,591,036 in 1905. Estimated population at the end of 1912, 1,962,411, of whom 626,649 Mohammedan, 856,158 Serbian Orthodox, 451,686 Roman Catholic, 8605 Greek Catholic, 6734 Protestant, and 12,798 Jewish. The larger towns, with 1910 population: Sarajevo, 51,919; Mostar (in the Herzegovina), 16,392; Banjaluka, 14,800; Tuzla, 11,333; Bjelina, 10,061; Srebrenica, 7215; Breka, 6647; Travnik, 10,061. In 1912, marriages numbered 16,363; births, 81,994 living and 178 still; deaths, 48,416.

In 1912 there were 544 elementary schools, 6

gymnasias, 2 realschulen, 3 training colleges for teachers, 11 advanced schools for girls, and 9 commercial schools, besides a number of other technical and professional institutions. In addition, there are numerous Mohammedan schools.

The soil is fertile and of the population in 1910 nearly 88 per cent were returned as agricultural, but nevertheless agriculture is not highly developed. Of the total area, nearly 50 per cent is under forest. The more important crops are corn, wheat, barley, oats, rye, potatoes, tobacco (a government monopoly), flax, hemp, and fruits, especially plums. Sugar beets are cultivated, and there is a sugar factory at Usora, near Doboj. The timber industry and cattle and sheep raising are important. According to the 1910 census, there were 221,981 horses, 393 mules, 6377 asses, 992 buffaloes, 1,308,930 cattle (cows, 400,986), 1,393,068 goats, 2,499,422 sheep, 527,271 swine, 2,230,510 fowls, and 195,204 beehives. Minerals are abundant, including lignite, iron, manganese, copper, and chrome ore. At the end of 1912, the length of railway in operation was 1912 miles; telegraph line, 1972 miles, with 4193 miles of wire. Post offices numbered 240. The budget for 1913 showed estimated revenue and expenditure of 92,997,594 and 92,987,887 kronen, respectively.

BOSTON UNIVERSITY. An institution for higher education, founded in Boston in 1869. Number of students in all departments in the autumn of 1915 was 2450. The faculty numbered 176. Prof. Emil Carl Wilm succeeded Benjamin W. Van Riper in the department of philosophy. The total benefactions received by the university during the year amounted to \$17,000. The productive funds amounted to about \$1,000,000, and the total income to \$263,350. The library contained 63,000 volumes.

BOTANY. Aside from the usual meetings of botanical organizations during the year, a Western Branch of the American Phytopathological Society was organized at Corvallis, Ore., Dec. 29, 1914. Preliminary plans were also made for the formation of the American Ecological Society to be affiliated with the American Association for the Advancement of Science.

Among botanists of note who died in 1915 were: Dr. C. E. Bessey, of the University of Nebraska; J. M. Bailey, colonial botanist to the Queensland government; William Barbey, Swiss botanist associated with Boissier; Dr. E. L. Greene, for many years associated with the University of California and later with the United States National Herbarium; J. Medley Wood, director Natal Botanic Garden; R. H. Lock, of the Ceylon Botanic Gardens, known for his contributions to Mendelism; and Edouard Prillieux, the well-known French phytopathologist. Dr. C. H. Peck, State botanist of New York since 1883, has retired from official life, as has also George Massee, who for many years was at the head of the department of cryptogamic botany at Kew. Dr. J. C. Arthur, botanist of the Indiana Agricultural Experiment Station, retired after 27 years' service at that institution.

The quarantine against certain counties in Maine and New York on account of the presence of the potato powdery scab (*Spongospora subterranea*) was withdrawn Sept. 1, 1915, and the foreign quarantine on Dec. 8, 1915, it having been determined that soil conditions elsewhere in the United States make it unlikely that the disease will spread and become troublesome.

The regulations concerning black scab or wart are continued. The citrus canker situation continues threatening in Florida and elsewhere. The importation of all kinds of citrus trees into the United States is now prohibited. Largely on account of the citrus canker, the Legislature of the State of Florida has provided for a Plant Board which is charged with the control of all plant diseases and insect pests.

Botanical workers along taxonomic lines have been unusually active, many floras, monographic studies, and lists of new species having been issued. Mez and his students have applied the methods of serum diagnosis to plants and found some interesting results which they claim can be utilized in the determination of the phylogeny of the higher plants. In ecology and plant geography, a number of contributions have appeared in this country, among which Harshberger has given the results of an ecological study of Southern Florida and of Nantucket Island; Harper, of Northern Florida; Nichols, of Connecticut; Crouch, of sand dunes on the coast of Southern California; and Rigg, of sphagnum bogs in Alaska.

PLANT BREEDING. Scientific investigations of various phases of plant breeding are receiving the attention of many workers. The question of mutation in *Eurothera* is still vigorously discussed. De Vries claims an examination of the original specimens of *Eurothera lamarckiana* shows they are identical with the forms now common on dunes near Liverpool and elsewhere. Bartlett has offered additional evidence of mutation in *Eurothera*, and has described what he terms mutation in mass in *Eurothera reynoldsii*. Davis, from a study of a large number of hybrids, found in the second generation forms agreeing with *Eurothera lamarckiana*. On the other hand, Jeffry has called attention to morphological objections to the mutation theory. Gates claims previous crossings are responsible for the germinal conditions which have resulted in the mutations of *Eurothera lamarckiana*. He also claims that mutations furnish the material for true evolution. Shull has reported negative correlations in *Eurothera* hybrids. Two types of changes, or mutations, are described by Stout as having appeared in *Coleus* grown vegetatively for six generations. Kearney has reported on the behavior of Egyptian cotton, which is said to exhibit tendencies to mutation. Mayer has continued the studies begun by Emerson on albinism in maize, and has found two types of albinism which are recessive to normal green color. Hayes has described additional mutations in tobacco, and East has reported on self-sterility in some *Nicotiana* hybrids. Belling has described the mode of inheritance of semisterility in certain hybrids of *Stizolobium*. Tammes suggests that the failure of flax hybrids to segregate according to the usual Mendelian expectancy is due to the low germinating power of seed of white-flowered plants. Roemer claims there is no essential difference between inheritance of morphological and biological characters, and that the capacity for production can be utilized in plant breeding experiments. MacDougall has continued his experiments which show the germ plasma of plants can be profoundly modified by various treatments.

PLANT PHYSIOLOGY, ETC. The attention of many histologists has been recently given to the presence and function of chondriosomes. Guil-

liermont claims they are the precursors of leucocytes, confirming the conclusions of Pensa and others, while Cavers says it yet remains to be shown that they are really cell organs. Studies in antagonisms between various salts in solutions continue to receive the attention of plant physiologists, and Stiles, Osterhout, Plate, and others have given the results of their investigations. Czapek claims that living protoplasm must be considered as a colloidal emulsion in hydrocolloidal media which contain proteins and mineral salts. Osterhout, from experiments with methyl green and other colors acted upon by sunlight, found formaldehyde was liberated, and hence he concludes that artificial photosynthesis has not been proven. Fincke has been unable to detect the presence of formaldehyde in plants as claimed by others. Moore believes iron in a crystalloidal or colloidal form is present in the chloroplasts of green plants. In its absence no chlorophyll is formed, although iron is not present in the coloring matter. Keegan, from an extensive review of literature, concludes that Grafe's claim that there is no specific chromogen for anthocyanin is incorrect. Moreau claims anthocyanin is of mitochondrial origin, Löwischin, that it is synthesized by the nucleus from organic materials furnished by the plant, and Czartowski, that its development may be favored by lowering the nitrogen content. Everest claims anthocyanins always occur as glucosides, and that they exhibit different colors according to the media. Kisselew confirms Fischer's claim of accelerated growth in atmospheres containing increased carbon dioxide content. West has given a review of the literature of the chemistry of plant pigments other than chlorophyll. Iwanowski claims the yellow coloring matter associated with chlorophyll acts as a screen, protecting chlorophyll against the injurious violet rays of light. Hall, Armstrong, and others claim the soluble sap pigments in plants are formed by the oxidation of colorless chromogens through the agency of oxidases. Loeb and Wasteneys have shown that light response is the same in plants and animals, and Bose claims the transmission of excitation is essentially the same in both. Schmidt, from a study of the effect of light of different wave-lengths on plants, concludes that the blue rays are more active than usually reported. Ultraviolet rays were found by Stoklassa to exert a marked influence on the development and activity of chlorophyll-bearing organs. Dangeard found that different plants varied in respect to the penetration of violet and ultraviolet rays. The stimulating effect of high frequency electric currents is due to the oscillating field and not to the heat produced, according to Homberger. Carl found the injury to plants by the mercury vapor lamp was due wholly to the chemical activity of the ultraviolet rays. Bovie described the effect of Schumann rays on the activity of protoplasm. Miege and Coupé found the morphology and structure of plants were influenced by X-rays, the growth of some being increased with the strength and frequency of the applications. Sutton reported gains in the growth of rape stimulated with radio-active ores in 1914, but in 1915, experiments with radium bromide gave injurious effects. Rusby claims radio-active earths increased the growth of many species of plants, and Bastian found similar results. Molisch, however, reports the stimulating effect of radium emana-

tions not equal to that induced by means of warm water.

MISCELLANEOUS. The effect of smoke and vapors on vegetation continues to occupy the attention of many investigators. Crowther and Steuart found leaves at all stages of growth subject to injury by town smoke, conifers more than others. Wisliczenus and others claim the injury is due not to the carbon and insoluble salts present in smoke, but rather to the sulphur compounds, especially the sulphites and sulphides. Ewart believes the injury to plants by coal gas and tar vapor is increased by heat and insolation. Harvey and Rose have found the odorous constituents of coal gas are only slightly toxic to plants, while the inodorous, as ethylene, are highly injurious. Lieske reports a group of aerobic bacteria which are able to assimilate carbon dioxide from the air and utilize its energy. Otis, from a study of the transpiration of submerged plants, has accumulated data showing what plants may be allowed to grow in storage reservoirs and what ones should be excluded. Dorsey has found that sterility in grapes is due to functionless pollen rather than to the pistils. Crocker and Graves claim there is a close relation between the time and temperature required to coagulate the proteins in seeds and the duration of their vitality. Howard has published the results of an extended investigation on the rest period of plants. Withers and Carruth have concluded that the poisonous principle in cotton seed is gossypol, first isolated by Marschlewski. Brenchley takes exception to the claim that organic plant poisons are stimulating when present in very small quantities, and she has shown many exceptions to this hypothesis. Skinner has found salicylic aldehyde, a reputed soil constituent, is injurious to plants. Ruprecht claims iron and aluminum sulphate are injurious to clover seedlings, while Hart and Tottingham found leguminous and cruciferous plants were stimulated by calcium and sodium sulphates. Elemental sulphur proved injurious, probably through its conversion to sulphites. Tottingham claims that chlorine has a specific function for some kinds of plants. Kratzmann found some plants had a selective affinity for aluminum. It is accumulated in the sporophylls of cryptogams and in the flowers of angiosperms. Mazé claims that aluminum, boron, fluorine, and iodine are necessary to the proper development of the maize plant, and that chlorosis follows the absence of iron, sulphur, and magnesium. Gautier found fluorine has a stimulating effect on many kinds of plants.

PLANT DISEASES. Tranzchel, Klebahn, Fraser, Arthur, and others have given additional data regarding the biological relationships of rusts. Fischer has reported studies on rust specialization, and Stakman found biological races in some of the grass and cereal rusts. Reed claims there is a marked correlation between attacks of powdery mildews and the physiological condition of their host plants. Westerdijk claims plant diseases are less common in the tropics than in temperate climates and attributes it to the tropical temperatures being too high for the development of many fungi. R. E. Smith has expressed a doubt regarding the existence of physiological diseases of plants. He believes they will ultimately be found to be due to some specific organism. McAlpine considers bitter pit of apples in

Australia a result of faulty transpiration and other physiological activities. Clinton continues to advance the theory that the mosaic disease of tobacco is not due to fungi or bacteria, while Allard believes it is caused by some organism not recognized by reason of its extreme smallness. Two physiological troubles of cotton in the West Indies are considered due to unfavorable weather conditions. Eriksson claims additional proof for his mycoplasma theory of rust transmission, while Beauverie, Buchet, and others claim the presence of spores within the seed coats as a means of original infection. Montemartini says cereal rusts are over-wintered in Italy in the uredo stage. A study of the stalk disease of cereals by Voges has shown about a dozen species of fungi capable of producing the same general symptoms.

Investigations on the chestnut blight fungus, *Endothia parasitica*, are still in progress, although active measures for its control have been abandoned. The fungus has recently been reported in Vermont, North Carolina, and Nebraska, the last case being a nursery infection. The spores have been found carried by winds to a distance of 400 feet or more and the nuts and burs are also infected. The chinquapin has recently been found infected by the blight fungus. The white pine blister rust has appeared in new localities. Hedgecock and Long have described several diseases of coniferous trees. A disease of maple trees characterized by sudden wilting and dying has been reported in Virginia. Birch trees in many parts of Europe are attacked by *Plowrightia virgultorum*, according to Massee. A destructive disease of mulberry trees, the cause of which is unknown, is reported in France and Italy. The citrus canker, which is proving so destructive in Florida and elsewhere, is due to bacteria, according to the investigations of Hasse. An appropriation of \$35,000 was made by Congress for combating it, and the States where it prevails have also contributed for its eradication. A disease of walnut trees in California, due to a species of *Dothiorella*, has been described by Fawcett. Recent reports suggest the occurrence of fire blight of pear trees in Switzerland. A form of this disease in which trunks of apple trees are attacked near the ground is reported in Pennsylvania by Orton. Studies of rots of fruits and vegetables by Miss Ames show they should be held as near zero temperature as possible in storage. A large number of diseases of vegetables, fruits, and other economic plants have been described during the past year.

Experiments in the control of plant diseases are in progress in many countries, the efficiency of the applications being especially investigated. Scott has called attention to barium polysulphide as a promising new fungicide.

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C. Standley, *Flora of New Mexico* (Washington, 1915).

BOURGET, PAUL. See FRENCH LITERATURE, Fiction.

BOVERI, THEODOR. A German zoölogist and educator, died Oct. 16, 1915. Born at Bamberg on Sept. 12, 1862, he was educated at the Realgymnasium of Nürnberg and at the University of Munich, where he received his Ph.D. degree in 1885. He was in 1887 a privat-docent at Munich, and since 1893 was professor of zoölogy at the University of Würzburg. For the year 1905-06 he was rector of the university. Boveri did important work on the excretory organs of *Amphioxus*; *Die Nierencanalchen des Amphioxus* (1892), but his most important researches were in the line of cytology where he did pioneer and epoch-making work. In his *Zellen Studien* (I-IV, 1887-1900) he gave in detail the maturation, fertilization, and cleavage of the egg of *Ascaris*, with especial reference to the behavior and fate of the chromatic material. Two later studies (1905, 1907) were devoted to the record of experiments on the egg of the sea urchin, especially as relating to normal and abnormal fertilization. In 1904 in his *Konstitution der chromatischen Substanz des Zellkerns*, he took a decided stand in favor of the theory of the individuality of the chromosomes. Many of the arguments in favor of the now widely held chromosome theory of heredity are based on these papers of Boveri's. Boveri was prominent as an educator, and in recent years many American students worked in his laboratory. He was an honorary M.D. of the University of Marburg, and a member of several learned societies.

BOWDOIN COLLEGE. An institution for higher education at Brunswick, Me., founded in 1794. The total enrollment in all departments in the autumn of 1915 was 457, and there were 89 members of the faculty. There were no notable changes in the membership of the faculty during the year, and no noteworthy benefactions were received. The productive funds at the close of the fiscal year amounted to \$2,264,034, and the income for the fiscal year was \$148,181. The library contained about 110,000 volumes.

BOWLES, SAMUEL. American editor, died March 14, 1915. He was born in 1851, and was educated at public and private schools, taking also a special course at Yale. He began work as reporter on the *Springfield Republican*, which had been established by his grandfather in 1826, soon becoming an editorial writer, and later (1855) manager. In 1858, on the death of his father, he took charge of the *Republican* as editor and publisher. During this time he held the paper in the front rank of American dailies. He received the degree of A.M. from Amherst, and L.H.D. from Olivet College.

BOWLING. The Americal Bowling Congress in 1915 passed legislation barring all teams east of Buffalo and Pittsburgh from competing in its tournament. As an offset to this action some of the Western bowlers took part in the annual tournament of the National Bowling Association held in New York City.

The winners of the various events in the American Bowling Congress tournament which took place in Peoria, Ill., follow: Individual—W. H. Pierce, Pueblo, Col., 711; two-men teams—Allen and Allen, Detroit, Mich., 1297; five-men teams—the Barry Kettlers, Chicago, Ill., 2907.

George Newman of New York City won the

individual title in the National Bowling Association tournament with a score of 675. The two-men team championship went to Walter and Smith of Rutherford, N. J., with 1232 points. The Aurania bowlers of New York City captured the five-men team honors with a total score of 2993.

BOXING. The great event of the year 1915 in the boxing world was the defeat of Jack Johnson by Jess Willard in a battle for the heavy-weight championship of the world. The bout was held near Havana, Cuba, on April 5th after a series of delays and postponements that bade fair at one time to result in the abandonment of the project. About 15,000 persons witnessed the fight which was waged in a ring on the Oriental Race Track, a few miles from the heart of Havana. The receipts were estimated at \$65,000.

Johnson entered the ring a pronounced favorite, as the record of Willard was not impressive and it was figured that the big Kansan would be utterly at sea when confronted by the speed and skill of the negro. For 16 rounds the predictions of the experts held true. Johnson landed blow after blow and at one time drove Willard to the ropes by the ferocity of his attack.

But the fact remained that Willard was still on his feet at the beginning of the 17th round and furthermore did not appear to have been bothered in the least by the shower of blows that had been rained on him. Johnson in truth was the tired man. He had realized that if he were to come out victorious he must use rushing tactics, for he was facing one who had two big advantages—youth and unusual stamina.

So the tide of battle turned and by the end of the 18th round the frenzied spectators were shouting for the knockout blow which they knew must come soon. It came after one minute and 26 seconds of fighting in the 26th round, when a left to the body was followed by a right to the jaw. The white race had regained its lost laurels.

No other boxing titles changed hands during the year, although Johnny Ertle claimed the bantamweight championship through his defeat of Kid Williams on a foul. A new boxer to spring into prominence was Les Darcy of Australia, a middleweight who knocked out Eddie McGoorty and outpointed Jimmy Clabby. Darcy arranged to visit the United States during 1916 and make a bid for the middleweight title of which Al McCoy is the claimant.

The bout of the year which attracted the most interest in New York City was that between Mike Gibbons and Packey McFarland at Brighton Beach. The men battled to a draw before a \$58,000 "gate."

The championships of the Amateur Athletic Union were decided at Boston on April 7th. The results of the final bouts were: 108-pound class—Howard Root of the Cleveland A. C. defeated Ben Bailey of the Adams A. A., Malden, Mass.; 115-pound class—Tony Vatlan, Brighton, Mass., defeated Julius Walters, Cleveland A. C.; 125-pound class—Arthur Strawhacker, Cleveland A. C., defeated John J. Emery, Cambridge, Mass.; 135-pound class—Mike Crowley, Malden, Mass., defeated C. Simonson, Union Settlement A. C., New York; 158-pound class—A. Kaufman, Trinity Club, Brooklyn, defeated Walter Wyss, Cleveland A. C.; 175-pound class—Edward C. Carr, Boston, defeated Charles W. Olsen, Boston;

heavyweight class—Arthur Sheridan, Trinity Club, New York, defeated James McDonald, Milton, Mass.

BOYCOTT. **DANBURY HATTERS' CASE.** This famous case which grew out of a strike in 1902 of the United Hatters of North America against Loewe and Company of Danbury, Conn., was advanced to its final stage by a decision of the United States Supreme Court, handed down Jan. 5, 1915. The case had been before numerous courts; in 1908 the United States Supreme Court declared the boycott illegal and authorized a suit for damages under the Sherman Act; and as long ago as October, 1909, damages under the Anti-Trust Law were assessed at \$232,240. Later appeals and judgments in 1912 and 1913 fixed the damages against the union at \$252,130, and authorized the assessment of these damages upon the individual members of the union, whether they had expressly assented to the boycott or not. It was this judgment which was affirmed by the United States Supreme Court on January 5th, thus making the total damages to be paid by the union members, including interest, nearly \$300,000. Probably no labor case of recent years has been of greater interest to lawyers, employers, labor leaders, publicists, and the general public. Since the union was not deemed sufficiently responsible financially, the suit for damages had been brought against individual members. Of the 243 original defendants only 186 survived when the final decision was rendered. Their bank accounts and real estate had been under attachment since the beginning of the suit. The union indemnified these members for their bank accounts, but refused to assume responsibility for the homes owned by 120 of them. The union did, however, at a meeting in May, 1915, vote to levy an assessment of 1 per cent per year on the earnings of all members to meet the expenses and damages of the suit. This was expected to realize between \$30,000 and \$40,000 a year. Meanwhile the officers of the Hatters' Union sought aid from the American Federation of Labor, but the Executive Council of the Federation on January 13th decided that the legal aid already given and the activities in behalf of the Clayton Act discharged all their obligations. However, at the annual meeting of the Federation in November, it was voted to request each member to set aside one hour's pay on Jan. 27, 1916, for the relief of the Danbury hatters. Finally the Danbury hatters petitioned Congress through Connecticut representatives in February to relieve them from the award of the court. This petition was based on the fact that the intent of the Sherman Law to exempt labor unions had not been made clear by the framers, and that in consequence the hatters had suffered an unjust hardship.

The decision of the court left the exact legal status of the trade unions somewhat indefinite. It was made clear that under the Sherman Law the members of trade unions could be held financially responsible for boycotts of the compound sort, when the trade boycotted is interstate, and this fixing of financial responsibility upon the union and its individual members was believed to be a serious blow to organized labor. But it was believed that section 20 of the Clayton Act of 1914, which prevents the issuance of injunctions against primary and secondary boycotts, would, until judicial interpretation of such section, permit unions to carry on peaceful persuading of

third parties to cease relations with a party to a trade dispute, such persuasion being unaccompanied by threats or coercion. Nevertheless, there were those who held that this provision of the Clayton Act would prove an insecure basis for boycotts when tested in the courts. See also **STRIKES AND LOCKOUTS.**

BOY-ED, CAPTAIN. See **UNITED STATES AND THE WAR.**

BOY SCOUTS OF AMERICA. An organization founded in 1908 for the purpose of drilling boys between the ages of 12 and 18 in self-reliance, manhood, and citizenship. It was the outgrowth of a similar movement in England, started by Gen. F. Baden-Powell. In the United States its founders were Ernest Thompson Seton and Daniel C. Beard, who combined two organizations of boys into one association. There were in 1910 over 10,000 scout masters in the United States, and over 300,000 members in the organization. During the latter part of 1915 a movement for an endowment of \$2,000,000 to carry on the expenses of the organization was begun. The honorary president is President Woodrow Wilson; honorary vice-presidents—William H. Taft and Theodore Roosevelt. The president is James E. West.

BRACKETT, CYRUS. American physicist and educator, died Jan. 29, 1915. He was born in Parsonfield, Me., in 1833, and graduated from Bowdoin College in 1859. In 1863 he was instructor in chemistry at Bowdoin College, and became professor there in 1864. Appointed professor of physics at Princeton University in 1873, he held that position until 1908, when he was made professor emeritus. Honorary degrees came to him from Lafayette and Bowdoin colleges, and from Princeton University.

BRADDON, MARY ELIZABETH. English novelist, died Feb. 4, 1915. She was born in London in 1837. Her father, who was a solicitor and a man of literary tastes, encouraged his daughter to develop a talent for writing poetry and fiction. At an early age she wrote serious and sentimental poems and sketches, and when she was 23 years old (1860) a publisher who had been attracted by her work offered her 50 dollars for a story which would combine the human interest of Dickens and the plot development of Wilkie Collins. To meet this offer she wrote *Three Times Dead*. It was not very successful, but two years later she published *Lady Audley's Secret*, which was one of the most widely read books of the day. The success of this novel established her fame and she was thenceforth greatly sought after by publishers. In quick succession followed *Aurora Floyd* (1862), *The Doctor's Wife* (1864), and from that time on for many years she was one of the most popular writers of England. Her later books, however, never reached the success of *Lady Audley's Secret*. Her novels dealt chiefly with English life. Her last book was *Miranda* (1913). She married John Maxwell, and her son, William Babbington Maxwell, was a well known writer of novels and stories.

BRAUN, LILY. See **GERMAN LITERATURE, Fiction.**

BRAZIL, UNITED STATES OF. A federal republic of South America. The capital is Rio de Janeiro.

AREA AND POPULATION. Neither the area nor the population is definitely known. Among the varying estimates of area, the one which for the present seems best to represent the extension of

the republic is 8,497,540 square kilometers (3,280,900 square miles). The 1890 census returned a population of 14,333,915, and the 1900 census, 17,318,556. Since the latter date it is generally believed that the population has rapidly increased, so that the number of inhabitants in 1913 was estimated at 24,308,000. This figure, however, is regarded by some authorities as excessive. The following table shows by states the estimated area and population (1913), and names the state capitals:

	<i>Sq. km.</i>	<i>Pop.</i>	<i>Capitals</i>
Amazonas . . .	1,894,724	500,000	Manáos
Pará	1,149,512	780,000	Belém
Maranhão . . .	459,884	600,000	São Luis
Plauhy	801,797	450,000	Therézina
Ceará	104,250	1,000,000	Fortaleza
Rio Grande do Norte	57,485	480,000	Natal
Parahyba	74,781	650,000	Parahyba
Pernambuco . . .	128,895	1,650,000	Recife
Alagoas	58,491	800,000	Maceió
Sergipe	89,090	500,000	Aracajú
Bahia	426,427	2,560,000	São Salvador
Espirito Santo . .	44,889	480,000	Victoria
Rio de Janeiro . .	68,982	1,250,000	Nichtheroy
São Paulo	290,876	8,200,000	São Paulo
Paraná	251,904	570,000	Curitiba
Santa Catharina .	48,585	510,000	Florianopolis
Rio Grande do Sul	286,553	1,750,000	Porto Alegre
Minas Geraes . . .	547,855	4,850,000	Bello Horizonte
Goyaz	747,811	803,000	Goyaz
Matto Grosso . . .	1,378,788	800,000	Cuyabá
Fed. District . . .	1,118	1,000,000	Rio de Janeiro
Acre Territory . . .	191,000	195,000	Rio Branco
Brazil	8,497,540	24,308,000	Rio de Janeiro

The population of cities is so variously estimated that until a census is taken little dependence can be placed upon published estimates. Rio de Janeiro (including the whole federal district) is supposed to have about 1,000,000 inhabitants; São Paulo, 400,000 to 450,000; São Salvador (Bahia), about 300,000.

The reported number of immigrants to Brazil from 1820 to the end of 1914 is 3,415,741. Immigrants in 1913 numbered 192,684; in 1914, 82,572. In 1913 and 1914 respectively, 78,208 and 33,918 arrived at Rio de Janeiro, and 110,976 and 47,570 at Santos. Immigration is chiefly to the southern states, where the climate is more healthful. In the period 1907-13, immigrants numbered 845,289; of these, there were 324,431 Portuguese, 164,332 Spaniards, 145,016 Italians, 46,195 Russians, 38,213 Syrians, etc., 30,431 Germans, 21,100 Austro-Hungarians, 11,868 Japanese, 7899 French, and 6033 British.

EDUCATION. As in most of Latin America, the greater part of the population is composed of illiterates. Considerable effort, however, has been made in recent years to further elementary education, which is free, secular, and in some states, nominally compulsory. Schools of all kinds number upwards of 13,000, with an estimated enrollment of nearly 750,000. Some provision is made for secondary education; in 1909 the reported number of secondary schools was 327, with 30,258 students. There are a number of normal, special, and technical schools. Brazil has no university, but in several of the large cities are faculties of law, medicine, and engineering.

PRODUCTION. Agriculture is the principal source of wealth, but vast areas of the country are unsettled and even unexplored. The crop of first commercial importance is coffee, grown chiefly in the state of São Paulo, but also in Rio

de Janeiro, Espirito Santo, and Minas Geraes. Coffee production in 1909-10, 11,501,023 metric quintals; in 1910-11, 7,610,131; in 1911-12, 7,473,600; in 1912-13, 6,300,000. The crop for 1914-15 was estimated at 10,500,000 quintals. Next to coffee in commercial importance is rubber, which grows wild in the Amazon region, and the cultivation of which is encouraged by the government. Implements and material for use in the culture, gathering, and refining of rubber are admitted to the country free of duty; demonstration farms are conducted to promote the culture, and bounties are granted to cultivators. Other important crops are sugar cane, produced chiefly in Pernambuco and other parts of the northeast; cotton, also largely grown in the northeast; maté (herve maté), chiefly in Paraná; cacao, especially in Bahia; tobacco, in Bahia and Rio Grande do Sul; besides these are large crops of corn, rice, bananas, and manioc, the last forming the staple food of the people. According to a 1913 enumeration, there were in Brazil, 7,289,690 horses, 30,705,400 cattle, 10,649,000 sheep, 10,000,000 goats, 3,207,940 mules and asses, and 18,500,000 swine. Parts of Brazil are rich in minerals, but mining is not greatly developed; gold, manganese, monazite sand, and gems are produced. Manufacturing has become of much importance in the federal district and shows a considerable development in the states São Paulo, Rio de Janeiro, Paraná, Rio Grande do Sul, Sergipe, Pernambuco, Ceará, and Bahia. The leading manufacture is cotton-piece goods.

COMMERCE. Imports and exports of merchandise, special trade, have been as follows, in thousands of milreis (paper):

	1902	1907	1910	1912	1913
Imports—					
471,114	644,938	713,868	951,870	1,007,495	
Exports—					
785,940	860,891	989,418	1,119,737	972,731	

With the paper milreis considered to be worth 32.4 cents, the imports and exports of merchandise in 1912 were equivalent in value to \$308,243,736 and \$362,794,846 respectively; in 1913, \$326,428,509 and \$315,164,687. The leading imports include machinery and other iron and steel manufactures, railway materials, cotton fabrics, coal, flour, codfish, wine, arms and ammunition, kerosene, paper, and jerked beef. In 1913 and 1914, respectively, the coffee export was 13,267,449 and 11,271,000 sacks (of 60 kilos each); rubber, 36,232 and 33,468 metric tons; tobacco, 29,388 and 26,980; maté, 65,415 and 59,354; sugar, 5367 and 31,860; cacao, 29,759 and 40,767; cotton, 37,424 and 30,434; hides, 35,075 and 31,442.

The following table compares the trade by countries with that of 1910, in thousands of dollars:

	<i>Imports</i>		<i>Exports</i>	
	1910	1913	1910	1913
United Kingdom	65,842	79,881	72,105	41,702
Germany	36,775	57,044	35,626	44,392
United States	29,704	51,290	110,144	102,568
France	21,863	31,940	25,642	38,686
Argentina	19,767	24,294	11,409	14,848
Belgium	10,461	16,679	5,510	8,093
Portugal	12,866	14,328	819	1,589
Italy	7,867	12,866	2,054	4,067
Uruguay	5,991	7,047	5,569	5,167
Total, including other	231,292	326,429	304,870	315,165

In 1913, there were entered at the ports, 27,782 vessels, of 29,170,179 tons, of which sailing vessels numbered 6295, of 606,286 tons. Brazilian vessels, 20,905, of 10,343,968 tons, of which sail 5743, of 251,195 tons. British tonnage entered, 9,866,817; German, 4,285,095; French, 1,306,102; Italian, 1,124,068. North American tonnage entered was only 24,240.

COMMUNICATIONS. As reported for Dec. 31, 1914, the length of railway in operation was 26,062 kilometers (16,194 miles). The reported length in operation Dec. 31, 1913, was 24,580 kilometers (15,273 miles); of this, lines belonging to and managed by the federal government comprised 3522 kilometers (2188 miles); lines belonging to the federal government and leased to companies, 9218 kilometers (5727 miles); lines conceded by the federal government, some with and some without interest guarantee, 5558 kilometers (3454 miles); lines operated by private companies under concessions of state governments, 6282 kilometers (3903 miles).

Telegraphs in 1912: offices, 2244, with 58,257 kilometers of line and 117,682 kilometers of wire. Radiotelegraph stations, 27; on board ships, 62. Post offices (1914), 3587.

FINANCE. The monetary unit is the gold milreis, equivalent to about 54.6 cents. The ordinary medium of exchange is the paper milreis. Its par value is 32.444 cents, but its actual value fluctuates, being in 1915 about 25 or 26 cents. The budget for 1913 showed estimated revenue of 106,382,884 milreis gold and 353,257,000 milreis paper, and estimated expenditure, 63,284,719 gold and 469,463,810 paper; for 1914, revenue, 130,219,000 gold and 367,511,000 paper; expenditure, 95,469,000 gold and 435,773,000 paper; estimated expenditure for 1915, 70,999,236 gold and 378,862,047 paper. Public debt, Dec. 31, 1913: foreign debt, £91,609,100 and 299,032,000 francs; floating foreign debt, £2,000,000; internal debt, 701,382,600 milreis; floating internal debt, 278,501,725 milreis. Paper money in circulation, 601,488,303 milreis.

ARMY. At the end of the year 1914, the new Brazil infantry regulations were published, and embodied the result of modern study, being practically identical to the Argentine regulations, and both being translated bodily from the German.

NAVY. The navy in 1915 included the following vessels: Two battleships (*Minas Geraes*, 1908; *São Paulo*, 1909), aggregating 38,500 tons; 2 armored coast guards (1898 and 1899), 6320 tons; 2 monitors (1905), 940 tons; 1 protected cruiser (1896), 3450 tons; 2 scout cruisers (*Bahia* and *Rio Grande*, 1909), 6200 tons; 3 torpedo cruisers (1896-98), 3090 tons; 10 torpedo-boat destroyers (1908-10), 6500 tons; river gunboats, transports, etc. The dreadnought *Rio de Janeiro* (27,500 tons) was completed at Elswick in 1914. Brazil sold the vessel to Turkey, and it was renamed *Sultan Osman I*. It did not join the Turkish fleet before the outbreak of the war, when it was taken over by the British government and received the name *Agincourt*.

GOVERNMENT. The chief executive is the President, who is elected for four years by direct vote and is not eligible for the succeeding term. He is assisted by a Cabinet of seven members appointed by and responsible to himself. The Congress consists of two houses, the

Senate and the Chamber of Deputies. Senators, 63 in number, are elected by direct vote for nine years. The deputies, numbering 212, are elected for three years. For the term ended Nov. 15, 1914, the President was Marshal Hermes da Fonseca. The Vice-President, Wenceslão Braz Pereira Gomes, was elected President for the ensuing term; Vice-President, Urbano dos Santos.

The states have elective governors and legislatures and enjoy a large degree of autonomy.

HISTORY. Economic Conditions. The opening of the year found the country just emerging from the financial and business crisis into which it had been plunged during the preceding year. The European war had deprived Brazil of its best customers, made it impossible to secure imports or money abroad (see *INTERNATIONAL YEAR BOOK*, 1914), and had even reduced the amount of credit with foreign banks on which Brazilian bankers had been accustomed to depend. The financial administration of the country was paralyzed, and, as a result of their inability to dispose of their products in the disorganized state of the market, many of the people suffered severely. Under the able administration, however, of President Wenceslão Braz, the country soon began to emerge from this crisis, which had seemed so threatening at the close of the previous year. In the north, particularly in the city of Pernambuco, the commercial centre of the district, trade began to revive, and by March was in a fairly prosperous condition. In the south, especially in the state of Rio Grande do Sul, business had been less affected by the abnormal conditions, and in March was nearly normal. American merchants were more encouraged and began to offer their goods with better results. Early in May the President recommended to Congress the amendment of the electoral law, the revision of the customs tariff, the acceptance of the remainder of the Civil Code, the voting of a budget, and the adoption of financial methods adequate to improve the condition of the country. In the following month the Chamber of Deputies approved an issue of 30,000 *contos* (\$191,100,000) with which to pay treasury debts contracted prior to 1915. The government likewise authorized the Bank of Brazil to act as a discount agency in the sale of coffee and other national products. Protective tariff measures were passed to aid in the establishment of a market for these products.

Relations With Other South American Countries. In an effort to bring about better diplomatic as well as industrial and economic relations with the other leading powers of South America, Dr. Lauro Muller, Premier of Brazil, left Rio de Janeiro in the last of April to visit several of the other nations of Latin America. In the last of May a treaty of peace was signed at Buenos Aires by Dr. Muller and the representatives of Argentina and Chile. A Brazilian newspaper in writing of this conference, said:

"The journeys of Lauro Muller both in the United States and in the Southern Continent were the consecration and crowning of our traditional political policy. All our diplomatic future will be developed along the line traced for more than four score years. All our international policy revolves still around those two great principles which the empire established—

harmony with the United States and peace with South America.

"The ABC alliance before its actual consecration was able to show itself a diplomatic force. It shunned conflicts between the powers of North and South America, and now this instrument of peace affirms that while working for the harmony of others it assures at the same time the unchangeableness of its own spirit of coöperation."

This treaty meant an actual alliance between these strong South American republics, an idea which had long been hoped for but which had never been consummated. It was stated unofficially that the United States might be asked to enter this alliance. In August, Brazil joined with the United States, Argentina, Chile, Guatemala, Uruguay, and Bolivia in an effort to bring about law and order in Mexico, and in October Brazil recognized Carranza as the provisional president of Mexico (see MEXICO).

Relations with the United States. The trouble in Europe made it possible for the United States to enter into closer economic relations with Brazil and American goods were in greater demand than ever before. In May it was reported unofficially that the Brazilian government was endeavoring to float a loan of \$15,000,000 in this country. The failure of London to become enthusiastic over the Argentine bonds and the rapidity with which these bonds were bought up in New York convinced the government that the United States was the best place to look for financial assistance. Brazil took a prominent part in the Pan-American financial conference held in Washington in May. This conference was called at the instance of President Wilson in an attempt to better financial conditions existing in North and South America. The Brazilian delegates to the conference recommended among other things:

"The establishment of a reliable means whereby merchants and manufacturers of each nation can determine with reasonable accuracy the financial responsibility of the purchaser of the other nations; it strongly recommends that there be established between the United States and Latin-American countries a system of direct exchange based on the dollar unit of the United States of America in order to facilitate the interchange of products adapted to the needs of American countries."

BREEDING. See STOCK RAISING AND MEAT PRODUCTION.

BRETHREN, CHURCH OF THE. A religious denomination known also as the Dunkers or Dunkards. There are three branches, the Conservative, the Progressives, and Old Order. Of these the Conservative is the largest. It included in 1915 about 97,000 communicants, 990 churches, and 3009 ministers. The next in importance is the Progressives, which has 2720 communicants, 212 churches, and 200 ministers. The Old Order has about 3500 communicants, 72 churches, and 218 ministers. There is also a small branch called the Seventh Day German Brethren. This has only about 275 communicants. The Conservative group maintains ten schools, one of which is the Bethany Bible School in Chicago, devoted entirely to study in the Bible. There is a large publishing house at Elgin, Ill., where a large number of papers and books are issued. Mission work is carried on in Denmark, Sweden, India, and China. The an-

nual convention was held at Hershey, Pa., in June, 1915. The Progressive branch maintains a publishing house at Ashland, Ohio.

BREWING. See LIQUORS.

BRIAND, ARISTIDE. See FRANCE, *History*.

BRICK. See CLAY-WORKING INDUSTRIES.

BRIDGES. During the year 1915 there was considerable construction of large bridges under way in America, but few new projects were undertaken. In Europe, on the Continent, demolitions and the construction or replacement of bridges purely for military purposes were far more to the front than civil engineering. In India the Hardinge Bridge over the Lower Ganges in Bengal, a long steel truss structure which had been under construction for nearly seven years, was opened on March 4, 1915. It is over a mile long, with 15 trusses, each of 345 feet span. The most important work of the year was the closing of the Hell Gate arch of the New York Connecting Railway, from Long Island to the mainland, while the Quebec Bridge construction maintained satisfactory progress and was substantially advanced. Progress was also to be noted on the large bridges crossing the Ohio River at Metropolis, Ill., Sciotoville, Ohio, and Pittsburgh, Pa., and over the Mississippi River at St. Paul, Minn., Keokuk, Iowa, and Memphis, Tenn. In the American bridge construction under way the use of high strength steels was notable, and five of the most important bridges building during the year were of special material in at least some of the parts. These structures, however, were only a small proportion of the tonnage actually fabricated at the great bridge shops, so that the use of high strength steels was to be considered special rather than general.

Within the last few years there has been a tendency in American bridge construction, particularly where reinforced concrete and masonry are employed, to demand more ornamental treatment and to secure the coöperation of architects. This was particularly true in the case of city railway bridges as well as for parks and boulevards. This tendency has been shown at Philadelphia and in the decoration of the Smithfield Bridge in Pittsburgh. A notable example was the Q Street Bridge across Rock Creek, Washington, D. C., which is a five arch span structure of reinforced concrete. The tone of this bridge is red, the main part of the spandrels being reddish concrete, bush-hammered for rough surfaces, and the quoins, coping, railing, and abutment faces of red sandstone, whose color is matched in the concrete by mixing with the cement a special red sand. There is also ornamental carving on the railing, and a carved head at the base of each cantilever, while four huge bronze buffaloes face each other on the pedestals at the approaches.

Important progress was made during the year on movable bridges, the vertical lift and bascule types were favored forms of construction, and some notable projects were carried out. A new type of swing bridge was designed by J. B. Strauss, to whom earlier was due the counterbalanced lever lift bridge familiarly known as the bascule bridge, which is now so widely used. The Strauss Cantilever Swing Bridge, as the design is familiarly known, has for its chief characteristics, first, the use of direct driven trucks running upon ordinary railroad rails to effect rotation; and second, the construction of

the central portion of the draw span as a cantilever projecting beyond the centre pier with the arms pin-connected at their ends so as to form simple spans from the ends of the cantilever to the abutments. In each arm the top chord is connected with the top chord of the central draw portion by a two-panel link, which is in turn connected to a pivoted vertical, while the pivot point of that vertical connects with an operating strut and a driving motor on the central draw portion, so that when the strut is drawn backward the four linked elements on each side of the centre act as a double toggle, raising the end of each arm off its bearings on the abutment until the span is free to turn. A series of trucks under the central draw at four points, the intersections of the four verticals of the central span with the chords, comprise the turning mechanism, the number of wheels on each truck varying and running on four concentric rails. When the bridge is in its closed position a wedge is automatically operated and the live load of the bridge is taken off the trucks and transmitted directly to the piers. With the lifting of the arms the wedges are automatically withdrawn and the bridge then moves with the trucks. The operating mechanism includes a driving mechanism on the trucks, consisting of electric motors which are geared to the driving wheels. The advantage claimed for the long Strauss bridge is that the trucks replace the drum, roller, and tread of one type of swing or the corresponding centre trailer wheels of the other, producing a saving both in steel and cost of fabrication, and eliminate the costly circular rack used in all types of swing bridges, while it makes possible the use of cantilever and simple span construction in the process in place of continuous girders, thus reducing the weight per foot as well as the total loads. By eliminating the spider and end lifts there is a lesser weight to move, and as the bridge is more simple in construction, its operation and maintenance cost less.

The most important bridge proposed during the year was a new Thames River Bridge to be built by the New York, New Haven and Hartford R. R., at New London, Conn., to take the place of the five span structure built in 1888-89. Although this is a two-track structure, the increased train weights made necessary in 1908 the limitation of its use to single track operation, and as the bridge is on the main line between New York, Providence, and Boston, the efficiency of transportation on the system was seriously interfered with. The new bridge is to be designed so as to carry four tracks with the heaviest known loading, the superstructure being arranged on this basis, but at first the superstructure will be built for two tracks only. There are to be three spans of 330 feet, one of 185 feet, and one of 212 feet. It also will be a five-span structure with an electrically operated bascule lift span. The bridge is to be 185 feet upstream from the old bridge, which is to be presented to the State of Connecticut for a highway bridge. Foundations for the four piers of the new bridge will range from 75 to 142 feet in depth, and the piers themselves will be made of concrete with masonry facing between high and low water. Three piers are to be constructed by open well dredging, but a pneumatic caisson will be used for the fourth. The extreme dimensions of the piers are 42 x 98 feet. About 48,000 cubic yards of concrete will be required. The

superstructure is to contain 5000 tons of steel, and while contracts had not been let towards the end of 1915, it was assumed that the work would be under way in 1917. Two bridge approaches of 1300 and 1600 feet will be required. The estimated cost was \$2,500,000.

The year 1915 was notable for the fact that two long steel arch bridges in process of erection were closed, one of which was the 977½-foot Hell Gate Bridge, where the closure of the arch was made on October 1st, four months after work on the main arch had begun. This is the longest steel arch span in the world, while the third longest was the bridge in Cleveland, Ohio, with a 591-foot arch span and double deck floor, which was closed on October 8th. In the construction of these arches it is interesting to note that the adjustment of the Hell Gate arch involved the use of hydraulic jacks and about 1¼ hours' work, while the closure of the Cleveland bridge was made by the use of screw toggles in about 1 hour and 50 minutes. Up to Oct. 1, 1915, when the Hell Gate arch was closed, 13,000 tons of steel had been placed, and at the end of the year practically all of the steel in the floor was in position, so that a record of some 19,000 tons in seven months was made. Progress was also made with the bridge spans, and one day—March 8th—a world's record of 1504 tons of steel placed was made. It was expected that the entire New York Connecting Railroad, of which the Hell Gate Bridge is the principal part, with its viaducts and other structures, would be completed within eighteen months after the time of closure of the main arches.

The working season on the Quebec Bridge, which contains the record length span of 1800 feet, closed on Nov. 9, 1915, and about 32,000 tons of steel were placed during the season in somewhat over six months. False work was erected on the south shore, the south 515-foot cantilever arm and main posts, part of the north anchor arm, and the 580-foot north cantilever arm, forming the main significant work of the year, involving the erection of 44,000 tons out of a total of 63,000 tons of steel going into the bridge. In a single day 670 tons of steel were placed by one traveler, as compared with the record of 410 tons under similar conditions in 1914. The entire erection of the Quebec Bridge demonstrated the accuracy of the shop work and efficient organization in the assembly yard and in the field. Flying false work and electrically operated travelers all contributed to the successful prosecution of the work.

At Sciotoville, Ohio, the piers were completed for the Chesapeake and Ohio Northern Railway Bridge, which is the longest long-span riveted continuous truss bridge in the United States, having two 750-foot spans. Progress was being made on the material and the erection of the superstructure was announced for the following year. The longest pin connected simple truss span of the kind in the world, namely 720 feet in length, was a feature of the bridge which was being built jointly by the Chicago, Burlington and Quincy Railroad, and the Paducah and Illinois Railroad, at Metropolis, Ill. The piers were practically completed, but the superstructure was not to be erected until the spring of 1916. Important new records were also made in railroad plate girder construction in the track elevation work on the "Nickel Plate" at Chicago, where girders were used for the 130-foot, 6¼-

inch simple span. Plate girders 239 feet in length and 13½ feet deep were used by the Canadian Pacific near Montreal for the double track draw span across the Lachine Canal at Caughnawaga.

In the construction of the Harahan Cantilever Bridge over the Mississippi River at Memphis, high water caused a delay of two months, and it was not until the end of the year that the superstructure was put in position. The fixed span was swung, as well as the anchor arm, and one cantilever arm and one-half of the suspended span of the Memphis end were erected. Accidents occurred on December 23rd, 25th, and 29th due to high water in the Mississippi River. The false work between Piers 3 and 4 was carried out, taking with it some of the lower chord members and floor stringers. As the adjacent 621-foot fixed span had been swung two days previously and was completed, it remained intact, as well as the false work on which it rested at some points. The entire bridge had been erected except the two 186-foot cantilever arms, the 418-foot semi-suspended span, and one-half of the 418-foot suspended span.

A million dollar structure connecting Portland (Me.) with South Portland, across an arm of the harbor, was being erected during the year. It was distinguished by a great variety of design, embracing reinforced concrete girder and cantilever spans and steel cantilever girders with rolling-lift draw span. The new bridge at St. Louis, to which reference has been made in earlier issues of the YEAR BOOK (1911 and 1912), was having its \$2,000,000 approach completed, an undertaking on a par with the original construction.

A notable modern viaduct of granite masonry with architectural effects is the Fontpedrouse structure over the Tet River in France. This is a two level structure where the masonry arches are carried on high piers, one of which is supported on the crown of a pointed arch below. The lower narrow ravine is spanned by a 98½-foot pointed arch on whose keystone a high intermediate pier of the main arch viaduct is supported. The upper viaduct, which is only 6 per cent grade, consists of four 56-foot main circular arches, with twelve approach spans, also circular arches, about 29½ feet clear between the piers, two on one side and ten on the other. This viaduct carries an electric railway and has walkways on either side.

The world's largest reinforced concrete bridge was the Tunkhannock viaduct, on the Delaware, Lackawanna and Western, 240 feet in height, which was completed and put into service Nov. 7, 1915.

A notable bridge failure of the year was the Division Street Bridge in Spokane, which on December 18th collapsed, dropping a street car into the river, killing 5 passengers and injuring 12. A commission of engineers appointed by the State engineer reported that "the failure was due to the simultaneous breaking of the bottom chord bars of the first panel of the north end of the east truss because of granulation. There was no excessive load on the bridge at the time it collapsed." The commission also stated that the steel work showed every evidence of good character and that there was no reason to suspect defects of any kind in its composition. The bridge was built in 1892, and was a through subdivided Pratt Truss bridge, 180 feet long, of

ten 18-foot panels, with a 40-foot roadway, and two sidewalks. The designer believed that the failure was probably caused by an earlier injury to the structure when it had been repaired without proper heat treatment of various bars that were replaced.

BRITISH COLUMBIA. A province of the Dominion of Canada, between Alberta and the Pacific Ocean. Capital, Victoria. Area, 355,855 square miles. The population, according to the census of 1911, was 392,480, the increase over 1901 being 119.7 per cent. Victoria had in 1911 31,660 inhabitants; Vancouver, 100,401; New Westminster, 13,199. The provincial government is under a lieutenant-governor, appointed by the governor-general of the Dominion. He acts through an executive council, or responsible ministry, of seven members. There is a unicameral legislative assembly of 42 members elected by direct vote for four years. Lieutenant-Governor in 1915, Frank S. Barnard, who was appointed to succeed Thomas W. Paterson, Dec. 5, 1914. Premier in 1914, Sir Richard McBride. See CANADA.

BRITISH EAST AFRICA. See EAST AFRICA PROTECTORATE; UGANDA; ZANZIBAR.

BRITISH GUIANA. A British colony on the northeast coast of South America. The area is stated at 90,277 square miles. The interior is almost unbroken forest. Returns of the 1911 census were as follows: 6901 aborigines, 126,517 East Indians, 114,780 negroes, 2622 Chinese, 706 Africans, 10,084 Portuguese, and 3937 other Europeans; total, 296,041 (153,717 males, 142,324 females). The unenumerated aborigines in the unfrequented parts of the country are estimated at about 10,000. Population (1911) of Georgetown, the capital, 54,318. The production of cotton and coffee, once important, has declined. Sugar production is now the chief industry. There are 43 sugar plantations, with a combined area of 162,139 acres (72,527 under sugar cane, 6448 under plantains, etc., and the remainder pasture or uncultivated). The export in 1913 was 87,414 tons of sugar, 3,260,986 gallons of rum, and 6860 tons of molasses. Rice is grown in the lowlands on about 42,000 acres (export in 1913, 17,269,504 pounds, valued at £106,155). Balata, timber, and charcoal are also exported.

Gold and diamond diggers number about 10,000; gold export (1913), 79,194 ounces, valued at £287,361; diamond export, 9078 carats, valued at £17,149. About half the trade is with the United Kingdom and a third with the United States. Railways are as follows: Georgetown to Rosignol, 60½ miles; Vreeden Hoop to Greenwich Park, 15; branch to gold diggings, 18½. There are telegraph, telephone, and cable systems. State-aided schools (1913-14), 277, with 36,820 pupils; grant-in-aid, £31,357. In the following table the commerce statistics are for calendar years 1910 to 1913, inclusive; financial figures are for fiscal years.

	1909-10	1910-11	1911-12	1912-13
	£	£	£	£
Imports	1,774,457	1,749,766	1,703,355	1,694,155
Exports	1,985,337	1,820,198	1,798,597	2,198,120
Revenue	540,269	563,100	580,446	608,633
Expend.	546,711	542,757	590,745	592,532
Shipping * ..	897,864	1,006,199	921,385	.....

* Tonnage entered and cleared.

Customs revenue (1912-13), £336,907. Public debt, March 31, 1914, £883,415. Governor in 1915, Sir Walter Egerton, appointed July 5, 1912.

BRITISH HONDURAS. A British colony on the east coast of Central America. Area, 8598 square miles; population (1911 census), 40,510; estimate of April 2, 1914, 41,543. Belize, the capital, had (1911) 10,478 inhabitants; Stann Creek, 2640; Corosal, 1789; Orange Walk, 856. Valuable forests are alternated with stretches of rich arable land on which oil-bearing nuts, vanilla, etc., grow wild in great profusion. Wood-cutting is the main occupation of the people; the exports in 1913 included 15,027,000 superficial feet of mahogany, 1,330,237 of cedar, and 2812 tons of logwood. The fruit export (1913) included 617,537 bunches of bananas, 3,300,450 plantains, and 6,352,630 coconuts; other products are sapodilla gum (3,163,129 pounds in 1913), rubber (12,496 pounds), and sponges and tortoise-shell. In the following table commercial figures are for calendar years 1910 to 1913, inclusive; financial figures are for fiscal years.

	1910-11	1911-12	1912-13	1913-14
	£	£	£	£
Imports . . .	2,819,217	2,886,677	3,496,908	3,185,368
Exports . . .	2,344,380	2,685,849	2,856,043	3,126,225
Revenue . . .	459,295	1,201,908	575,243	590,982
Expenditure .	542,810	532,123	611,131	609,441
Shipping * .	979,427	588,867	630,064	816,858

* Tonnage entered and cleared.

There are telegraph and telephone lines, and 25 miles of railway. Sir Wilfred Collet was appointed Governor in 1913.

BRITISH INDIA. See INDIA.

BRITISH NEW GUINEA. See PAPUA.

BRITISH NORTH BORNEO. The northern part of the island of Borneo, forming together with adjacent islands a British protectorate, under the jurisdiction of the British North Borneo Company. Area, 31,000 square miles. The 1911 census returned about 208,000 inhabitants, mainly Bruneis, Illanuns, Bajaus, and Sulus on the coast, engaging in fishing and trade; Dusuns, who are agriculturists; Muruts, etc., in the interior—peaceable in the main, but occasionally engaging in head-hunting expeditions. The Europeans number about 400, and the Chinese 30,000. The exports go almost entirely to Singapore and China, and consist of timber in considerable quantities, tobacco, rubber, coconuts, sago, coffee, pepper, cattle, cutch, etc. The chartered company does not engage in trade. Coal is worked and iron ore and petroleum have been discovered. British, Mexican, and other dollars having ceased to be legal tender, the Straits Settlements dollar (worth \$0.56776) is now the standard coin. Completed railway, 130 miles. Imports (1913), 5,438,897 S. S. dollars; exports, 7,398,128; shipping entered and cleared, 547,044 tons; revenue proper, including land sales, 1,810,259 dollars; expenditure, 990,388. The company administers the country through a resident Governor. Sandakan (administration headquarters), Jesselton, Lahad Datu, Tawas, and Kudat are the principal towns.

BRITISH SOMALILAND. See SOMALILAND PROTECTORATE.

BRITISH SOUTH AFRICA. See SOUTH AFRICA, UNION OF.

BRITISH WEST AFRICA. A collective

name for the following British colonies and protectorates in western Africa: NIGERIA, including colony and protectorate; GOLD COAST, including Ashanti and the Northern Territories; SIERRA LEONE, including colony and protectorate; and GAMBIA, including colony and protectorate. See these separate titles.

BROOKE, RUPERT. English poet and writer, died April 23, 1915. He was born at Rugby in 1877, and was educated at Rugby School and at Kings College, Cambridge. He lived for some years in Cambridge, or in the neighboring village of Grandchester, and there wrote a volume of poems which was published in 1911. He enlisted at the outbreak of the war in Europe, and died as a result of blood poisoning while on board a French hospital ship. A number of poems inspired by the war show remarkable power. A posthumous volume, *Poems of Rupert Brooke*, was published in 1915.

BROWN, THOMAS JEFFERSON. American jurist, died May 26, 1915. He was born in Jasper County, Ga., in 1836, and was educated in the common schools and at Baylor University. He was admitted to the Texas bar in 1857, and practiced law in different cities in that State. In 1888 and again in 1890 he was elected to the Texas Legislature. In 1892 he was appointed judge of the District Court of Texas, and in the year following was made associate justice of the Supreme Court of the State. He became chief justice in 1911, and held that position at the time of his death.

BROWN UNIVERSITY. An institution for higher education, founded in 1764 at Providence, R. I. The total enrollment in all departments in the autumn of 1915 was 765 undergraduates, 209 in the separate Women's College, and 140 graduate students. The faculty numbered 94, including instructors and assistants. Prof. F. H. Allinson was appointed head of the department of Greek literature and history, in the place of Professor Manatt, deceased. Kenall K. Smith was appointed assistant professor of Greek literature and history. The university received no special gifts during the year. The productive funds at the end of the fiscal year ending June 30, 1915, amounted to \$4,566,134. The library contained 230,000 volumes.

BRYAN, GEORGE JAMES. American publisher and writer, died Jan. 23, 1915. He was born at Fosterdale, N. Y., in 1852; for a time taught school and did newspaper work; then entered the book business in New York City. He organized the University Society, and for it directed the compilation of anthologies, dictionaries, and reference works. He also made sets of subscription books which were sold to other publishers, under whose imprints they appeared. Notable among these was the large set, *Irish Literature* (10 vols.).

BRYAN, WILLIAM J. See UNITED STATES, Cabinet.

BRUCE REPORT ON ALLEGED GERMAN OUTRAGES. See BELGIUM, *History, Bryce Report*.

BRYN MAWR COLLEGE. An institution for higher education of women, founded at Bryn Mawr, Pa., in 1885. The total enrollment in all departments in the autumn of 1915 was 453 students. The faculty numbered 61. The college received during the year from the estate of the late Elizabeth Swift Shippen of Philadelphia, \$10,000; from Alexander Simpson of Philadel-

phia, for the foundation of a scholarship, \$5000; and from present students, alumnae, and friends of the college, for a new athletic field, \$4000. The productive funds in 1915 amounted to \$2,002,300, and the annual income \$395,624. The library contained about 75,000 volumes.

BUCKNAM, RANSFORD B. American engineer, known for many years under the title, "Bucknam Pasha," admiral of the Turkish fleet, died May 27, 1915. He was born in Maine in 1860. At the age of four years he was left an orphan, and received a scanty schooling in his native town. When still a boy, he became a sailor on the Great Lakes, and afterwards was in the employ of a line of Australian packets. After many years of service at sea, he became marine superintendent for the Cramps of Philadelphia. In 1904, when Sultan Abdul Hamid bought an armored cruiser from the Cramps, Bucknam was selected to take the vessel to San Francisco. At the time the Sultan was desirous of forming a first-class navy, and at once engaged Bucknam to superintend its upbuilding. He soon became a conspicuous figure among Turkish officials. His ability and scrupulous honesty made him unique, and he was one of the few persons trusted by Abdul Hamid. He was successively made a bey and a pasha, and was given the title of Admiral of the Fleet. After the deposition of Abdul Hamid, Bucknam was not able to agree with the Young Turks, and he retired to civil life. With the outbreak of the Italian War, he assisted the Turkish government by successful expeditions in blocking the line to the Tripolitan coast.

BUCKWHEAT. Statistics or estimates on the world's buckwheat production are not available. In 1915 Canada produced 8,101,000 bushels on 343,800 acres, the average yield per acre being 23.56 bushels. The United States, in 1915, as reported by the United States Department of Agriculture, produced 15,769,000 bushels on an area of 806,000 acres, the average yield per acre being 19.6 bushels. While the area, as compared with the acreage the preceding year, was greater by 14,000 acres, the production was 1,112,000 bushels less. The production in 1915 was also smaller than the average yield for the five years 1909-13, the difference being 828,000 bushels. Yields were reported in 1915 from 24 States, the range being from Maine to North Carolina and Tennessee in the South, and to Nebraska and Kansas in the West. As shown by figures on the production during the 10-year period 1905-14, the highest average yields per acre are secured in northern New England, Maine leading with 29.7 bushels, being followed by New Hampshire with 25.6, and Vermont with 23.7 bushels per acre.

BUILDING. See ARCHITECTURE; and FINANCIAL REVIEW.

BUILDING OPERATIONS. At the end of the year 1915 the new Building Code for the city of New York was all but completed. This code was being prepared by Rudolph P. Miller, formerly superintendent of the Building Department of Manhattan, in consultation with various engineering, architectural, and real estate interests. It was designed to provide a reasonable and substantial basis for future building construction and inspection in the city of New York, in which proper construction, fire protection, sanitation, and the general interest of citizens of all classes could best be served. The

code was taken up in detail and passed, after hearings of those interested, section by section, through the year, by the Board of Aldermen, and contained a number of important sections as well as changes. It was provided that a certificate of occupancy should be issued by the Superintendent of Buildings previous to the occupation of any new building, or one that had been altered, so that it would be impossible to use a structure for other purposes than those for which it had been designed and constructed. A new scheme of classification was adopted, a change in the fireproof limits was made, new specifications for lighting and ventilation not only for tenements but for other buildings were adopted, provision was made for increased exit facilities, for fire protection for high buildings, for projections beyond the building line, for reinforced concrete construction, for greater use of hollow tile, for terra cotta construction, for providing flues and chimneys for a lower building where the owner of adjoining property builds above the height of an existing structure of his neighbor, the inspection and certification of elevator installation, and for the assessment of penalties, and to provide for immediate compliance with the orders of the Building Department.

In Philadelphia new regulations in regard to the construction of reinforced concrete buildings were formulated, and provided that plans and specifications filed should be accompanied by stress computations and descriptions in detail, including the dimensions and nature of all reinforcements, the quality, proportions, and method of the concrete, and the dead and live loads which each floor was designed to carry. No deviation in the construction was to be permitted except upon the written consent of the Chief of the Bureau of Building Inspection, and the construction of a reinforced concrete building was to be under the constant supervision of an inspector furnished by the owner or architect and acceptable to the Chief of the Bureau, who was empowered to stop improper inspection at any point. It was further provided that the plans on file should be marked to indicate the progress of the work and give the times and dates when the concrete was deposited.

During the year there was published the *Fourth Edition of the Building Code*, recommended by the National Board of Fire Underwriters, prepared by Ira W. Woolson, the consulting engineer of the board, and incorporating the most advanced requirements in fire protective building construction. This code goes into building problems in considerable detail, and contains many features that have been incorporated in local codes, giving requirements for materials and permissible methods of construction. This code provides for a certificate of occupancy for the building and classification of buildings, both for construction and occupancy, and increased limitations for the use of combustible materials. Where sprinklers are used the code allows an increase of allowable floor area between fire walls, but limits the area according to the number of frontages on streets. There is also a limit to heights, provision for speedy egress, methods of elevator construction, outside stairways, fire or smokeproof doors, and other details of construction, the entire code representing the latest and most reasonable requirements in this field. The code also takes up materials and

working stresses, giving the latest developments for iron and steel, timber, and other materials, based on official and other tests. This code, which consists of 328 pages, illustrated, is published by the National Board of Fire Underwriters, New York, from whom it may be procured.

An important step was taken by the Secretary of the Treasury in reference to the construction of post office and Federal buildings, by the issuing of an order to establish uniformity and business economy in such work. Accordingly, four different classes of buildings were formulated, depending upon the amount of business transacted, and a policy of standardization was determined on, as well as the use of plans for buildings hitherto constructed. The four classes were as follows:

Class A.—For post offices of the first class with annual receipts of \$800,000 or over: Marble or granite facing; fireproof throughout; metal frames, sash, and doors; interior finish to include the finer grades of marble, ornamental bronze work, mahogany, etc. Public spaces to have monumental treatment, mural decorations; special interior lighting fixtures.

Class B.—Post offices of the first class with receipts from \$60,000 to \$800,000: Limestone or sandstone facing; fireproof throughout; exterior frames and sash metal; interior frames, sash, and doors wood; interior finish to exclude the more expensive woods and marbles; ornamental metal to be used only where iron is suitable; restricted ornament in public places.

Class C.—For post offices of the second class with receipts of \$15,000 or over, and of the first class up to \$60,000: Brick facing with stone or terra cotta trimmings; fireproof floors; non-fireproof roof; frames, sash, and doors wood; interior finish to exclude the more expensive wood and marble; the latter used only where sanitary conditions demand; public spaces restricted to very simple forms of ornament.

Class D.—For post offices having annual receipts of less than \$15,000: Brick facing, little stone, or terra cotta used; only first floor fireproof; stock sash, frames, doors, etc., where advisable; ordinary class of building such as any business man would consider a reasonable investment in a small town.

During the year a testing machine for testing the strength of fire resistance of building columns was installed in the Underwriters' Laboratory at Chicago by a joint body formed of the Associated Factory Mutual Fire Insurance Companies, National Board of Fire Insurance Companies, and the United States Bureau of Standards. This machine was designed and built to test to destruction full sized building columns under end load and at temperatures equaling those of a general conflagration. Provision was made for a series of tests, and a preliminary circular was published in which criticism of the methods to be followed was asked, and suggestions for extension of the work requested. See also AGRICULTURAL EDUCATION; ARCHITECTURE; and FIRE PROTECTION.

Returns of building operations from 71 of the largest cities in the United States, compiled by the *Engineering News* (New York), indicated that in 1915 there was an increase of construction of about 6 per cent over the previous year. In the early part of the year conditions remained about the same as in 1914 and there

was general inactivity, but an improvement toward the end of the year denoted increased prosperity. The accompanying statistics indicate the trend of operations during the year. In the Eastern States there was a considerable increase, namely, from \$287,558,291 in 1914, to \$333,534,253 in 1915; in the Southern States a decline from \$48,518,674 in 1914, to \$42,897,814 in 1915; in the Central States an increase from \$257,628,670 in 1914, to \$290,902,907 in 1915; and in the Western States a decline from \$81,957,225 in 1914, to \$48,987,814.

BUILDING OPERATIONS IN THE U. S. 1914 AND 1915

Statistics of Plans Filed. Compiled by *Engineering News*.

EASTERN STATES			
Population Census of 1910	City	Building 1915	Operations 1914
100,253	Albany, N. Y.	\$4,771,980	\$6,194,738
558,485	Baltimore, Md.	14,129,186	11,823,376
670,585	Boston, Mass.	24,455,268	20,520,555
102,054	Bridgeport, Conn.	12,671,414	3,673,756
423,715	Buffalo, N. Y.	11,792,000	12,992,000
73,409	Elizabeth, N. J.	1,280,909	1,346,933
98,915	Hartford, Conn.	5,603,695	4,044,481
70,324	Hoboken, N. J.	694,329	768,342
267,779	Jersey City, N. J.	5,064,986	3,501,503
347,469	Newark, N. J.	8,315,559	9,472,409
96,652	New Bedford, Mass.	8,280,078	2,921,394
183,605	New Haven, Conn.	7,104,977	3,379,842
4,766,883	New York, N. Y.	28,119,100	20,296,843
	Bronx	35,295,018	38,866,890
	Brooklyn	64,648,669	45,470,965
	Manhattan	19,808,833	18,311,450
54,773	Passaic, N. J.	1,074,332	887,239
125,000	Paterson, N. J.	1,693,752	1,544,036
1,549,008	Philadelphia, Pa.	39,544,025	34,940,980
533,905	Pittsburgh, Pa.	13,337,010	18,194,682
58,571	Portland, Maine	1,594,359	1,176,795
96,071	Reading, Pa.	1,003,100	1,147,850
218,149	Rochester, N. Y.	9,106,133	8,733,257
129,667	Scranton, Pa.	1,785,365	3,409,920
88,926	Springfield, Mass.	6,052,181	4,998,192
137,249	Syracuse, N. Y.	4,661,216	2,838,973
74,419	Utica, N. Y.	2,076,720	1,797,535
145,986	Worcester, Mass.	4,571,864	4,808,353
Totals		\$333,534,253	\$287,558,291
SOUTHERN STATES			
154,839	Atlanta, Ga.	\$4,585,739	\$4,673,852
132,685	Birmingham, Ala.	1,849,411	3,143,250
44,604	Chattanooga, Tenn.	536,885	1,057,087
92,104	Dallas, Tex.	3,420,512	5,248,610
73,312	Ft. Worth, Tex.	1,156,907	2,061,908
78,800	Houston, Tex.	2,086,489	3,485,856
223,928	Louisville, Ky.	3,793,045	4,389,745
181,105	Memphis, Tenn.	2,696,138	2,946,764
339,075	New Orleans, La.	2,825,595	2,959,751
67,452	Norfolk, Va.	1,865,958	2,114,680
127,628	Richmond, Va.	3,244,752	3,283,845
96,614	San Antonio, Tex.	1,712,275	2,859,480
37,782	Tampa, Fla.	1,385,924	1,373,071
331,069	Washington D. C.	11,738,184	8,962,780
Totals		\$42,897,814	\$48,518,674
CENTRAL STATES			
69,067	Akron, O.	\$4,847,695	\$3,733,500
50,217	Anton, O.	1,919,690	1,409,349
2,185,183	Chicago, Ill.	98,794,280	83,262,110
363,591	Cincinnati, O.	13,311,789	8,785,158
570,663	Cleveland, O.	32,576,524	27,308,060
181,511	Columbus, O.	4,973,033	6,895,061
86,368	Des Moines, Ia.	1,873,606	1,937,144
465,766	Detroit, Mich.	32,235,450	26,845,225
78,446	Duluth, Minn.	2,713,884	2,877,808
69,647	Evansville, Ind.	1,830,367	1,223,288
112,571	Grand Rapids, Mich.	2,674,987	3,621,919
233,650	Indianapolis, Ind.	6,984,924	7,792,808
82,331	Kan. City, Kan.	963,249	1,076,563
248,881	Kan. City, Mo.	10,687,405	10,103,970
378,857	Milwaukee, Wis.	12,349,068	9,783,921
301,408	Minneapolis, Minn.	17,849,171	15,214,525

Population Census of 1910	City	Building 1915	Operations 1914
19,444	Oak Park, Ill.	3,646,583	2,311,270
124,096	Omaha, Neb.	5,582,005	4,610,456
66,950	Peoria, Ill.	1,948,974	2,615,876
687,029	St. Louis, Mo.	11,438,020	12,568,584
214,744	St. Paul, Minn.	11,688,665	14,659,282
168,497	Toledo, O.	7,714,674	6,085,182
76,066	Youngstown, O.	2,799,367	2,856,221

Totals ... \$290,902,907 \$257,628,670

WESTERN STATES

213,881	Denver, Col.	\$2,648,573	\$3,780,458
319,198	Los Angeles, Cal.	11,030,087	17,282,881
150,174	Oakland, Cal.	4,842,969	4,619,835
207,214	Portland, Ore.	4,895,345	9,384,075
92,777	Salt Lake City, Utah	2,170,020	2,983,246
416,912	San Francisco, Cal.	14,893,726	28,177,572
237,194	Seattle, Wash.	6,470,655	12,655,600
104,402	Spokane, Wash.	1,181,097	984,047
88,743	Tacoma, Wash.	855,340	2,189,511

Totals \$48,987,814 \$81,957,225

BUKOWINA. See AUSTRIA-HUNGARY.

BULGARIA. One of the "Balkan States"; a constitutional monarchy of Europe; formerly a principality under the suzerainty of Turkey. Capital, Sofia.

AREA AND POPULATION. Area and population (Dec. 31, 1910) are shown below:

	Area		Pop.
	Sq. km.	Sq. m.	1910
Bulgaria, Northern.....	63,751.1	24,614	3,095,735
Eastern Rumelia	32,594.4	12,585	1,241,778
Total Bulgaria	96,345.5	37,199	4,337,513

The area acquired from Turkey in 1913 is stated at 26,100 square kilometers (10,077 square miles), with an estimated population of 709,600; area ceded to Rumania, 8340 square kilometers (3220 square miles), with 305,000 inhabitants. Thus the total area is about 114,000 square kilometers (44,000 square miles), with a population of about 4,742,000.

The ancient Bulgars were of Finnic stock; the modern Bulgarians are made up of Slavic, Teutonic, and Mongoloid elements, amalgamated with Mussulman and Greek. Their language belongs to the southern Slavic group and the Cyrillic alphabet is used.

The population in 1900 numbered 3,744,283, of whom 2,887,684 were Bulgarians, and 530,275 Turks. Of the total population in 1910, 3,497,794 were Bulgarians, 466,117 Turks, 121,435 Tziganes, 79,787 Rumanians, 43,273 Greeks, 40,118 Jews, 21,145 Pomacs, 18,050 Tartars, 12,914 Armenians, etc. Sofia had, in 1910, 102,812 inhabitants; Varna, 47,981 inhabitants; Ruschuk, 36,255; Slivno, 25,142; Shumla, 22,225; Plevna, 23,049; Philippopolis, the capital of Eastern Rumelia, 47,981. There were, in 1911, 41,868 marriages, 176,909 living births, and 74,860 deaths. Movement of population, 1909: 38,917 marriages, 172,583 living births, 1544 still-births, 113,304 deaths; surplus of births over deaths, 59,279.

RELIGION AND EDUCATION. The national religion is the Orthodox, the Bulgarian Church being a separate communion of the Eastern Church. In 1909-10 there were reported to be 3786 elementary schools with 8697 teachers and 430,011 pupils (262,394 boys and 167,717 girls); in 1910-11, 4674 elementary schools, with 8686 teachers and 453,592 pupils.

PRODUCTION. The following table shows main crops, area in hectares devoted to each; yields in quintals, and average yield per hectare in 1912-13:

	Hectares		Quintals		Qs.
	1911-12	1912-13	1911-12	1912-13	ha.
Wheat...	1,120,500	1,030,000	17,350,000	16,500,000	16.0
Rye...	215,000	185,000	3,150,000	2,750,000	14.9
Barley...	260,000	230,000	4,000,000	3,500,000	15.2
Oats...	180,000	170,000	1,750,000	2,000,000	11.8
Corn...	650,000	650,000	14,000,000	11,500,000	17.7
Rice...	8,000	8,000	80,000	35,000	17.7

Of the total area under cultivation (3,872,777 hectares in 1909), 2,394,252 hectares were planted to cereals, 523,371 to forage plants, 85,240 to vines, 60,259 to potatoes and other roots, 25,231 to melons, etc., 13,215 to industrial plants, 11,088 to legumes, 8277 to orchards and gardens, and 7621 to rosefields.

COMMERCE AND COMMUNICATIONS. In the table below will be found imports and exports in thousands of leva:

	1908	1909	1910	1911	1912
Imports	130,150	160,430	177,357	199,345	213,110
Exports	112,357	111,434	129,052	184,634	156,407

In thousands of leva the details of the 1910 trade are as follows: Imports—textiles, etc., 49,383; metals, etc., 23,299; machinery, etc., 19,777; colonial products, 10,348; skins, etc., 9188; timber, etc., 6993; chemical products, 5538; resins and oils, 5109; paper, etc., 3772. Exports—cereals, 80,811; animal products, 13,002; textiles, etc., 10,037; animals, 7324; perfumes, 5555; skins, 4238; colonial products, 2056; metals, etc., 1127; wooden-ware, 656; etc. In the order of their import importance the countries of origin and destination were Austria-Hungary, Germany, Great Britain, Turkey, France, Belgium, Italy, etc. Leading exports in 1912, in thousands of leva: cereals, 108,549; animal substances, 16,731; perfumes, 11,639; animals, 3989.

Total railway lines constructed and in operation in 1913, 2233 kilometers (1387 miles). Four lines of railway were under construction in Bulgaria previous to the outbreak of the Balkan War. The value of all lines is given (1909) as 225,530,645 leva; of rolling stock, 24,942,487. Net receipts (1909), 19,187,200; net expenditures, 13,873,687. For negotiations concerning the Dedeagatch Railway, see paragraph so entitled under *History*.

FINANCE. A table showing revenue and expenditure for three years in leva (1 leva = 19.3 cents) is given below (1912 budget):

	1910	1911	1912
Revenue	173,389,493	198,795,814	190,278,440
Expenditure	168,451,041	182,487,552	188,929,057

In 1911 the revenue from customs amounted to 63,230,000 leva; direct taxes, 39,949,000; transport, 30,420,000; domains, etc., 12,680,000; imports, 10,710,000; licenses, 9,450,000; fines, 1,031,000. Expenditure for public works, 30,382,000; instruction, 23,598,000; interior, 10,460,000; commerce and agriculture, 10,083,000; finance, 8,443,000; foreign affairs, 6,452,000; justice, 5,836,000. The budget for 1914 placed the revenue at 256,995,070 leva, and the expenditure at 254,787,677 leva, exclusive of 2,200,000 leva

extraordinary. The public debt at the end of 1914 amounted to 914,785,983 leva, including a floating debt of 302,401,607 leva.

ARMY. With the declaration of war by Bulgaria against Serbia, Oct. 9, 1915, and the previous state of war with Russia which began two days earlier, a new and well equipped army was put into the field. The rifles of the Bulgarian army were made after the Mannlicher and Mauser systems, the patterns of the latter having been captured from the Turks, so that both Austrian and Turkish cartridges could be used, and thousands of rounds for each type of rifle were on hand at the outbreak of hostilities. The victories of the Bulgarians over the Turks greatly augmented their artillery so that it was stated at the beginning of the war they had 750 light field guns, 300 75-millimeter Schneider cannon, and 150 rapid firers of the same calibre captured from the Turks, in addition to 250 Krupp guns, 87-millimeter; 150 Krupp guns, 75-millimeter; 40 Schneider rapid fire howitzers, 120-millimeter; 40 Krupp howitzers, of the same calibre; 25 150-millimeter Krupp guns; 30 rapid fire 75-millimeter mountain guns; 50 rapid fire Krupp guns of the same calibre.

NAVY. The navy includes 6 first-class torpedo boats (*Smely, Hrabry, Derzky, Choumny, Letiachty, and Stroggy*), of 100 tons each; 1 cruiser (*Nadejda*), of 735; 2 yachts, 5 transports, 2 second-class torpedo boats of 20 tons each, and some other small craft.

GOVERNMENT. The executive authority is vested in a King (since Oct. 5, 1908). Ferdinand I, King of the Bulgarians, was born at Vienna, Feb. 28, 1861, son of Prince Augustus of Saxe-Coburg and Gotha. Prince Boris (born Jan. 30, 1894) is the eldest son by the King's first marriage, in 1893, to Princess Marie Louise of Parma. His second wife (Feb. 28, 1908) is Eleonore of Reuss Köstritz.

By the constitution of 1879 (amended 1893 and 1911), the legislative authority was vested in a single chamber, the *Sobranje*, whose members are elected by universal manhood suffrage (one member to every 20,000 of the population). The King acts through a council of ministers nominated by himself.

On Oct. 9th, the minister of war, General Jekoff, resigned his position in the cabinet and assumed active command of the field army; he was succeeded as war minister by Major-General Naidenoff. At the same time the portfolio of the interior, which had hitherto been held by the premier, was given in charge of M. Christo Popoff.

HISTORY

NEUTRALITY AND NEGOTIATIONS. Although the Bulgarian government had publicly declared its determination to maintain a neutral position in the great war, and had reiterated its declarations of neutrality even after the entry of Turkey into the war, nevertheless the diplomats of the Triple Entente made every effort at the beginning of 1915 to bring Bulgaria into the war on the side of the Entente; and throughout the greater part of the year the most optimistic interpretation of Bulgaria's rather ambiguous attitude was cherished by the English press. The endeavor of English, French, and Russian diplomacy was to offer Bulgaria sufficient territorial compensations to ensure her friendship, to reconstruct the Balkan alliance

which had been so disastrously disrupted by jealousy in 1913, and to secure the intervention of Bulgaria in the war together with Rumania and Greece. The Serbian government, however, displayed the utmost reluctance, even when urged by the Entente, to yield to Bulgaria the full extent of her demands in Macedonia; as for Greece, while the premier, M. Venizelos, was willing to make concessions to Bulgaria, the King was obviously unfriendly to the project.

THE GERMAN LOAN. The probability of Bulgaria's joining the Allies was distinctly lessened when, at the beginning of February, Bulgaria effected a loan arrangement with a syndicate of German bankers, the *Disconto Gesellschaft*, whereby an advance of \$30,000,000 was to be made upon the \$100,000,000 loan negotiated by Bulgaria in the summer of 1914. About \$7,000,000 was to be applied to the service of the Bulgarian national debt, and of various other foreign obligations; about \$8,000,000 was to be placed at the disposal of the Bulgarian National Bank; and the balance of \$15,000,000 was to be paid in installments and applied to the budget. The strengthening of this financial bond between Bulgaria and Germany may account for the apparent distrust and diffidence with which Serbia, Greece, and Rumania regarded the negotiations for a reconstructed Balkan alliance affiliated to the Triple Entente. Still the Bulgarian premier emphatically declared that the loan had not involved any political obligations on the part of Bulgaria towards the Central Powers. "Bulgaria," said M. Radoslavoff, in a remarkable speech before the *Sobranje*, March 28th, "is not bound by engagements to any one, and, according to the view of the government, Bulgaria should not assume premature obligations, because in so doing, solely from sentimental reasons, the country might incur great danger. No one is looking to Bulgaria purely for Bulgaria's own sake. Each seeks Bulgarian co-operation in his own interests. Every Bulgarian government, therefore, must be on its guard against temptations, however attractive, whether they come from the West or from the East. . . . When the moment comes that our own interests are endangered, the people and the Government of Bulgaria will make the necessary decisions." In the light of subsequent events the premier's statement might be interpreted as evidence that even at that time the Bulgarian government had its ultimate alliance with the Teutonic Powers in view, and was prolonging negotiations with the Entente without the slightest intention of accepting the Entente's offers, "however attractive" they might be. At the time, however, the speech was regarded as an encouraging sign of Bulgaria's impartial readiness to bargain.

THE VALANDOVA INCIDENT. A Serbo-Bulgar frontier incident on April 2nd threatened so to inflame hostility between Serbia and Bulgaria as completely to destroy all possibility of an alliance. From the evidence published by the Serbian government it appeared that a force of Bulgarian *komitadjis*, some of them wearing the uniform of the Bulgarian army, and provided with small-arms and bombs of official Bulgarian and Turkish pattern, had crossed the frontier near Strumitza and attacked the Serbian frontier blockhouse at Valandova. Thirty Bulgars and 60 Serbs had been killed in the raid. The Bulgarian government disclaimed all responsibility for the affair, and furthermore alleged

that the trouble had been caused not by a Bulgarian invading party, but by insurgent Serbian citizens, probably Mohammedans, who had been driven to revolt by the notoriously harsh attitude of the Serbian government towards those of its newly acquired subjects in Macedonia, who were unwilling or unable to pose as loyal Serbs. The "Valandova Incident" was smoothed over, thanks to Russian diplomatic intervention.

THE DEDEAGATCH RAILWAY. Meanwhile Bulgaria was conducting negotiations with Turkey for the acquisition of the Dedegatch Railway. Bulgaria, it will be recalled (see YEAR BOOK, 1913), had been given one seaport, Dedegatch, on the Aegean, by the treaty of Bucharest; but the only railway connecting Dedegatch with the interior of Bulgaria passed through Turkish territory by way of Adrianople and the Maritsa valley. Bulgaria desired to obtain from Turkey the strip of territory lying west of the Maritsa and Tunja rivers, and including the railway station in a southeastern suburb of Adrianople (Karagatch) but not Adrianople itself; Turkey was decidedly reluctant to accede to this demand. Negotiations dragged on throughout the summer. On July 17th M. Panaretoff announced that a tentative arrangement had been agreed upon, whereby express trains might be run from Bulgaria to Dedegatch without stopping in Turkish territory. A more extensive agreement was unofficially reported, July 23rd. But as late as the third week in August rumors were current that Bulgaria was on the point of breaking off the negotiations in disgust and making war on Turkey.

NEGOTIATIONS WITH THE ENTENTE. The Entente during this time had been making earnest efforts to outbid the Turks. A joint note had been handed to the Bulgarian government by the representatives of the Entente at Sofia, May 29th. A little over a fortnight later Bulgaria replied, asking for more definite assurances of what she might expect in return for her support. The Entente, as it appeared, was unable to make such assurances convincing, for at the beginning of August, M. Radoslavoff gave out an interview avowing that he was conducting parallel negotiations with both sides, with the sole object of making the best possible bargain. In another interview, on August 9th, the Bulgarian premier made the significant statement that "Bulgaria is fully prepared and waiting to enter the war the moment she receives absolute guarantees that by so doing she will obtain that for which other nations already engaged are striving, namely, the realization of her national ideals. . . . The bulk of these aspirations lie in Serbian Macedonia, which with its 1,500,000 of Bulgarian inhabitants, was pledged and assigned to us at the close of the first Balkan War. It is still ours by right and principle of nationality. When the Triple Entente can assure us that this territory will be returned to Bulgaria and our minor claims in Greek Macedonia and elsewhere realized, the Allies will find us ready to fight with them. But these guarantees must be real and absolute. No mere paper ones can be accepted." At the time when this remarkable statement was made, Bulgaria had just concluded arrangements with the *Disconto Gesellschaft* syndicate of German bankers for an advance of \$50,000,000, of which about half was to be paid in cash and the remainder applied to outstanding obligations, and had given the Ger-

man syndicate a two years' option on an additional \$50,000,000 of Bulgarian 5 per cent government securities. Whether out of the suspicion which Bulgaria's German loan inevitably generated, or out of pure willingness to grant Bulgaria's request for more definite offers, the Entente Powers on August 10th delivered a joint communication at Sofia. The contents of the joint note were stated upon not altogether unimpeachable authority by the *Giornale d'Italia* to include the immediate cession to Bulgaria of that part of Serbian Macedonia which had been assigned to Bulgaria by the Serbo-Bulgarian treaty of 1912. Bulgaria was to renounce all claims to Saloniki, Vodina, and Uskub. Serbia was to be compensated with Seres and Kavala, which would be taken from Greece. In explanation of the failure of the Entente's diplomacy in Bulgaria, it may be pointed out that the Bulgarian government had good reason to believe that the offer of Macedonia, if made by the Entente, was not cordially concurred in by the parties most vitally concerned, Serbia and Greece; the prestige of French and British arms had been destroyed in the Dardanelles operations, and the prowess of Russia had just proved incapable of defending Warsaw; Turkey, moreover, was at last ready to cede the Dedegatch Railway.

AGREEMENT WITH TURKEY. Possibly the Bulgarian negotiations with the Entente were used by M. Radoslavoff to hasten Turkey's decision. At any rate, on August 23rd the conclusion of a Turco-Bulgarian treaty was announced, and the details of the agreement made public September 7th-8th. Bulgaria was to receive the corner of European Turkey marked off by the line of the Maritsa and Tunja rivers, including the railway station at Karagatch, but not including Adrianople. The treaty was finally ratified September 22nd, but a brief delay was to intervene before the territory was occupied by Bulgaria. Since considerable anxiety had been manifested with regard to the implications of this agreement with Turkey (the Entente Powers had presented a new note at Sofia, September 16th), M. Radoslavoff announced that Bulgaria had promised Turkey to maintain armed neutrality.

BULGARIA'S DECISION. The mobilization of the Bulgarian army, necessary for the maintenance of "armed neutrality," was announced September 21st by the Bulgarian minister in Washington. In spite of unfounded rumors of a cabinet split, which served to divert attention, the decision of Bulgaria to side with Turkey and the Central Powers could no longer be concealed. Sir Edward Grey, manifestly unconvinced by the official announcement of the Bulgarian government (September 26th) that mobilization was not preparatory to war, declared before the British House of Commons, September 28th, "If Bulgarian mobilization should result in Bulgaria assuming an aggressive attitude on the side of our enemies we are prepared to give our friends in the Balkans all the support in our power." Reports from London and Athens pointed to the existence of a secret treaty signed in July, 1915, between Bulgaria and the Central Powers, whereby Bulgaria was promised Saloniki, Kavala, Kastoria, Albania, and Macedonia, in return for intervention against Serbia. The growing anxiety of the Entente with regard to Bulgaria's intentions became still more manifest the first week in October, when Russia dispatched an ultimatum to Sofia. "The presence," affirmed

the ultimatum, "of German and Austrian officers at the Ministry of War and on the staff of the army, the concentration of troops in the zone bordering Serbia, and the extensive financial support accepted from our enemies by the Sofia cabinet, no longer leave any doubt as to the object of the military preparations of Bulgaria." The Bulgarian government was allowed 24 hours to dismiss the Teuton officers and "break with the enemies of the Slav cause and of Russia." The Bulgarian cabinet, however, was too confident to be swerved from its purpose by such means. M. Radoslavoff was quoted by the *Lokal Anzeiger* as saying, "Events coming in the near future promise more favorable results. Bulgaria will extend her frontiers toward the northwest and the south. Our relations with Rumania are cordial. The conflict between Rumania and the Central Powers already has been settled. Rumania will remain neutral during the whole of the offensive of the Central Powers against Serbia, even if new complications arise in the Balkans." With unfaltering confidence, therefore, not only in the strength of Bulgaria's army and in the prowess of her allies, but also in the security of her northern frontier, Premier Radoslavoff and King Ferdinand embarked on the great "national enterprise," and attacked Serbia on October 13th. War was declared against Serbia the next day. On October 14th Great Britain declared war on Bulgaria, and Sir Edward Grey admitted that the Central Powers had successfully outbid the Entente in their offers for Bulgarian support. Russia and Italy declared war against Bulgaria on October 19th. The details of Bulgaria's invasion of Serbia are given in the article on the WAR OF THE NATIONS (q.v.).

BULLEN, FRANK THOMAS. English author and lecturer, died March 1, 1915. He was born in Paddington in 1857. His education was limited to the public schools. He went to sea in 1869 and served in all parts of the world in various capacities, rising to be chief mate. In 1883 he became clerk in the Meteorological Office, continuing there until 1899. He began about that time to write sea stories, the first of them, *The Cruise of the Cachalot*, being a considerable success. This and his other writings show intimate knowledge of sea life, and remarkable descriptive power. His other books include *Idylls of the Sea*, *The Log of a Sea Waif*, *Our Heritage the Sea*, *The Call of the Deep*, *A Compleat Sea Cook*. He also contributed stories, articles, and essays to periodicals.

BUREAU OF CORPORATIONS. See TRUSTS.

BUREAU OF MINES. See UNITED STATES, section so entitled.

BUREAU OF SOCIAL HYGIENE. See PROSTITUTION.

BURG, FERDINAND. Formerly Archduke Ferdinand of Austria, died March 12, 1915. He was born in 1864, a nephew of the Emperor Francis Joseph, and brother of Archduke Francis Ferdinand, who was assassinated in Bosnia. On his marriage in 1911 to a daughter of Hofrat Czueber, a Swiss professor of engineering, all his privileges as a member of the Imperial family were renounced, and he assumed the name of Burg. Several years before the Emperor had declined to permit him to renounce his title and marry.

BURKE, ANDREW SHERIDAN. An American

soldier, died Jan. 12, 1915. He was born in Cincinnati in 1839. In 1861 he enlisted as a private in the Federal army, and served throughout the war, rising to the rank of captain. In 1866 he was appointed first lieutenant in the regular army. He became major in 1883; lieutenant-colonel in 1888; and colonel in 1892. In 1898 he was appointed brigadier-general of volunteers, and in 1902 brigadier-general in the regular army. In the same year he was retired at his own request. He received brevets for gallantry during the Civil War.

BURKE, THOMAS MARTIN ALOYSIUS. American bishop of the Roman Catholic Church, died Jan. 20, 1915. He was born in Ireland in 1840, but when still a child removed with his parents to Utica, N. Y. He studied at St. Michael's College in Toronto and at St. Charles's College in Maryland; he graduated from the latter institution in 1861, and in the same year entered St. Mary's Seminary, Baltimore, where he began the study of theology. At the end of three years he received the degrees of M.A. and D.D. and was ordained in 1864. He served as assistant in St. John's Church, Albany, and later became rector of St. Joseph's Church of the same city. He was appointed vicar-general of the diocese of Albany in 1877, and upon the death of Bishop McNierney was appointed administrator of the diocese. He was consecrated bishop of Albany in 1849. Bishop Burke was greatly interested in educational matters, and directed St. Joseph's School for Boys at Albany. Aside from his religious duties, he participated in civic affairs, and frequently acted as arbitrator in settling strike disputes in Albany and elsewhere. He was a Knight of the Holy Sepulchre, and Commander of the Holy Cross of Jerusalem.

BURNAM - EDDIN, MEHMED. Turkish prince, died March 11, 1915. He was born in 1886, the fourth son of Abdul Hamid, former Sultan. During the reign of his father he was the 14th in the line of successors to the throne according to the prescribed system of succession, but it was said that Abdul Hamid intended to make him his successor. In 1909, when the latter was dethroned, the prince was kept under guard in the palace for a time on the charge of being concerned in a conspiracy for the restoration of absolutism. He was assassinated, supposedly by political enemies.

BURR, JOSEPH ARTHUR. American jurist, died April 18, 1915. He was born in Brooklyn, N. Y., in 1850, and graduated from Yale College in 1871. He then studied law in Columbia Law School, graduating in 1873. In the following year he was admitted to the bar. In 1896 until the consolidation of Brooklyn with New York, he was the corporation counsel for the former city. In 1904 he was appointed justice of the Supreme Court of New York, and was a judge of the appellate division from 1909 until his death.

BUSSEY, CYRUS. American soldier, died March 6, 1915. He was born in Hubbard, Ohio, in 1833, received a common school education, and in his early years engaged in mercantile pursuits. In 1860 he was a member of the Iowa Senate as a Democrat, and was a delegate to the board of conventions which nominated Stephen A. Douglas for president. At the outbreak of the Civil War, he raised the third Iowa cavalry, and became its colonel. He was later promoted to be brigadier-general and brevet major-general.

At the battle of Pea Ridge he commanded a brigade; later was in command of the second cavalry division of the Army of the Tennessee; at the siege of Vicksburg was chief of cavalry of Grant's army; and he led the advance of Sherman's army against General Johnston at Jackson, Miss. He defeated General Johnston at Canton, on July 18, 1863. In the last year of the war he commanded the third division of the seventh army corps. After the war he became a commission merchant in St. Louis and New Orleans. He was for six years president of the New Orleans Chamber of Commerce, and in 1881 he removed to New York, which remained his home until his death. He was active in politics, and took part in campaigns from 1860 on. From 1889-93 he was Assistant Secretary of the Interior.

BUTTER. See DAIRYING.

CALIFORNIA. The population of the State, as estimated by the United States Bureau of the Census, on July 1, 1915, was 2,848,275.

AGRICULTURE. The acreage, production, and value of the principal crops, as estimated by the United States Department of Agriculture, in 1914-15, were as follows:

	Acreage	Prod. Bu.	Value
Corn 1915	64,000	2,624,000	2,809,000
..... 1914	60,000	2,160,000	1,879,000
Wheat 1915	440,000	7,040,000	6,688,000
..... 1914	400,000	6,800,000	7,072,000
Oats 1915	211,000	6,968,000	8,482,000
..... 1914	220,000	7,700,000	4,081,000
Rye 1915	8,000	112,000	101,000
..... 1914	8,000	136,000	116,000
Barley 1915	1,360,000	39,440,000	24,453,000
..... 1914	1,402,000	42,060,000	24,815,000
Rice 1915	34,000	2,268,000	2,041,000
..... 1914	15,000	800,000	800,000
Potatoes ... 1915	78,000	10,140,000	7,605,000
..... 1914	75,000	10,350,000	7,245,000
Hay 1915	2,511,000	4,520,000	50,624,000
..... 1914	2,700,000	5,265,000	43,173,000
Cotton 1915	84,000	634,000	1,822,000
..... 1914	47,000	50,000	1,670,000

a Tons. b Bales of 500 pounds each.

MINERAL PRODUCTION. The gold production of the State in 1914 was \$20,653,296, compared with \$20,406,958 in 1913. The increased output was about equivalent to the great placer yield. The mined production of silver in 1914 was 1,471,851 fine ounces, compared with 1,378,399 ounces in 1913; 473,143 ounces came from copper ores. In 1914 California produced 29,784,173 pounds of copper, compared with 32,492,265 pounds in 1913. In the total output, the State ranked seventh in 1914. California is first among the States in the production of petroleum. There were produced in 1914, 99,775,227 barrels, compared with 97,788,525 barrels in 1913. In the value of the production the State ranks second, being surpassed by Oklahoma. The output of 1914 was valued at \$48,066,096, compared with a value of \$45,709,400 in 1913. A total of 512 wells were completed in 1914, of which 465 produced oil.

TRANSPORTATION. The total railway mileage in the State on Jan. 30, 1915, was 11,778. This includes 8177 miles of main track, and represents an increase of 316 miles over the mileage of 1914. Railways having the longest mileage are the Southern Pacific, 6229; Atchison, Topeka, and Santa Fe, 2249; Northwestern Pacific, 451; San Pedro, Los Angeles, and Salt Lake, 511; Western Pacific, 498.

EDUCATION. The school population of the State in 1914 was 513,319. This includes 7808 students at the universities. In the same year the total enrollment in all schools up to high schools was 501,021, with an average daily attendance of 373,478. The teachers numbered 13,250 men, and 2369 women. Men teachers received an average yearly salary of \$1018, and women \$745. In the high schools the average yearly salary was \$1570 for men, and \$1125 for women.

FINANCE. The report of the State Treasurer for the biennial period 1912-14 shows cash receipts during the period of \$60,947,876. The disbursements amounted to \$66,530,156, leaving cash in the treasury on June 30, 1914, of \$19,213,233. This included a balance of \$9,903,533 at the beginning of the period.

CHARITIES AND CORRECTIONS. The State institutions for charities and corrections include State prisons at San Quentin and Folsom, the Preston School of Industry, the Whittier State School, California School for Girls, State Hospitals at Stockton, Napa, Agnew, and Mendocino, the Southern California State Hospital, the New State Hospital, Sonoma State Home, the Folsom State Hospital, and the Industrial Home for Adult Blind. The total expenditures for these institutions in 1914 was \$2,561,833.

POLITICS AND GOVERNMENT. The Legislature was in session in 1915. A measure was passed abolishing political party distinction. By the terms of this the names of the candidates for political parties would no longer appear on party ballots, except in the election for Congressmen and for presidential electors. The measure was defeated by referendum on October 28th. The Legislature enacted a provision for the employment of convicts for the building of roads.

On January 23rd, Governor Johnson declared himself opposed to any amendment to the anti-alien land act, passed by the Legislature of 1913. A bill had been introduced to the Assembly eliminating the three-year leasing clause, and the Governor declared that he would veto this bill if it were passed. The measure failed in passage. The alien land law was held constitutional on August 4th, in a decision handed down by Judge Works of Los Angeles. In this decision the court held that an alien could hold a mortgage on land. The case was that of a mortgage given to a Japanese for a term of years. The attorneys for the mortgagee claimed that a Japanese could not hold a mortgage which might give him title to the property. Judge Works held that a mortgage was merely incidental to the commercial transaction, which an alien is permitted to make under the law and the American-Japanese treaty of 1911. The California law provides that any one unfitted to become a citizen in the United States shall not acquire land in California.

STATE OFFICERS. Governor, Hiram W. Johnson; Lieutenant-Governor, John M. Fahleman; Secretary of State, Frank C. Jordan; Controller, John S. Chambers; Treasurer, F. W. Richardson; Attorney-General, U. S. Webb; Surveyor-General, W. S. Kingsbury; Superintendent of Public Instruction, Edward Hyatt; Adjutant-General, C. W. Thomas, Jr.

JUDICIARY. Supreme Court: Chief Justice, Frank M. Angellotti; Associate Justices—F. W. Henshaw, William G. Lorigan, Henry A. Melvin, Lucien Shaw, William P. Lawler.

STATE LEGISLATURE:

	<i>Senate</i>	<i>House</i>	<i>Joint Ballot</i>
Republicans	20	33	53
Democrats	10	17	27
Progressives	9	28	37
Socialists	..	2	2
Republican majority ..	1	..	..

CALIFORNIA, UNIVERSITY OF. A State university for higher education at Berkeley, Cal., founded in 1868. The total attendance in all departments in the autumn of 1915 was 8736. There were 434 members of the faculty. Departments of the university include the college; colleges of law, medicine, and pharmacy; the university farm; and the San Francisco University of Art. The endowment amounts to about \$5,000,000, and the annual income to about \$2,000,000. The library contains about 300,000 volumes, and several thousand manuscripts. The president is Benjamin Ide Wheeler.

CALLENDER, GUY STEVENS. American educator and economist, died Aug. 9, 1915. He was born at Harts Grove, Ohio, in 1865, and graduated from Oberlin College in 1891. He took a post graduate course at Harvard, receiving the degree of Ph.D. in 1897. In 1895-6 he was instructor in political economy at Wellesley College, filling the same position at Harvard from 1897-1900, while from 1900-03 he was professor of political economy and sociology at Bowdoin College. From the latter year until his death he was professor of political economy in the Sheffield Scientific School. He was the author of *Selections from the Economic History of the United States, 1765-1860* (1909).

CAMBODIA. A kingdom of Farther India, constituting a French protectorate and forming part of French Indo-China. The capital is Pnom-Penh; its population, which is variously stated, is probably over 60,000. Much of the country is covered with forest. The natives cultivate rice, cotton, betel, tobacco, cardamoms, etc., and raise cattle and buffaloes. Most of the foreign trade passes through Saigon (Cochin-China). The name of the native king is Sisowath. See FRENCH INDO-CHINA.

CANADA, DOMINION OF. A British self-governing dependency north of the United States. Capital, Ottawa, in Ontario.

AREA AND POPULATION. Canada's nine provinces, with the Yukon Territory and Northwest Territories, have a combined area computed at 3,729,665 square miles. By provinces and territories, the land and water areas are stated as follows, in square miles:

	<i>Land</i>	<i>Water *</i>	<i>Total *</i>
Alberta	252,925	2,860	255,285
British Columbia	858,416	2,489	855,855
Manitoba	281,926	19,906	251,832
New Brunswick	27,911	74	27,985
Nova Scotia	21,068	360	21,428
Ontario	365,880	41,382	407,262
Prince Edward Island ..	2,184	..	2,184
Quebec	690,865	15,969	706,834
Saskatchewan	248,882	8,318	251,700
Yukon Territory	206,427	649	207,076
Northwest Terr.	1,207,926	34,298	1,242,224
The Dominion	3,608,910	125,755	3,729,665

* The water area is exclusive of Hudson Bay, Ungava Bay, the Gulf of St. Lawrence, and all other tidal waters excepting that portion of the St. Lawrence River which is between Pointe-des-Monts in Saguenay and the foot of Lake St. Peter.

In the foregoing table, the areas of Ontario, Quebec, Manitoba, and the Northwest Territories have been adjusted to conform to the Boundary Extension Acts of 1912, whereby these three provinces were enlarged by annexations from the Northwest Territories. The following table shows the area by provinces before the Boundary Extension Acts became operative, the population in 1891, the population according to the censuses of April 1, 1901, and June 1, 1911, and increase per cent of population between 1901 and 1911:

	<i>Sq. mi.</i>	<i>Pop. '91</i>	<i>Pop. '01</i>	<i>Pop. '11</i>	<i>Inc.</i>
Alta.	255,285	..	73,022	374,663	413.08
B. C.	355,855	98,173	178,657	892,480	119.68
Man.	73,732	152,506	255,211	455,614	78.52
N. B.	27,985	321,263	331,120	351,889	6.27
N. S.	21,428	450,396	459,574	492,338	7.13
Ont.	260,862	2,114,321	2,182,947	2,523,274	15.56
P. E. I.	2,184	109,078	103,259	93,728	*9.23
P. Q.	351,873	1,488,535	1,648,898	2,008,232	21.49
Sask.	251,700	..	91,279	492,482	439.48
Y. T.	207,076	..	27,219	8,512	*68.73
N. T.	1,921,685	98,967	20,129	18,481	*8.18
Can.	3,729,665	4,833,289	5,371,315	7,206,643	34.17

* Decrease per cent.

The increase of the area of Manitoba, Ontario, and Quebec, and the decrease of the area of the Northwest Territories, effected by the Boundary Extension Acts of 1912, are shown below, together with the present area and the population adjusted to the 1911 census:

	<i>Increase Sq. m.</i>	<i>Present area</i>	<i>Pop. '11</i>
Manitoba	178,100	251,832	461,630
Ontario	146,400	407,262	2,527,292
Quebec	354,961	706,834	2,005,779
Northwest Territories. *	679,461	1,242,224	5,900

* Decrease.

The average density of population in 1911, calculated upon the total of 3,729,665 square miles, was 1.93 per square mile. Density per square mile by provinces: Prince Edward Island, 42.91; Nova Scotia, 22.98; New Brunswick, 12.61; Ontario, 9.67; Manitoba, 6.18; Quebec, 5.69 (figures for the last three provinces are calculated on the area as before the changes of 1912); Saskatchewan, Alberta, and British Columbia, each less than 2 per square mile.

Division of the 1911 population into urban and rural gives 3,280,964 of the former (45.53 per cent) and 3,925,679 of the latter (54.47 per cent). It should be pointed out that the urban population includes the inhabitants of certain places which, in some classifications, would have been regarded as rural. The urban total includes 90,284 inhabitants of places with a population less than 500; 180,784 dwelling in towns with a population between 500 and 1000; 429,553 in towns between 1000 and 3000; and 226,212 in towns between 3000 and 5000. But of the total population in 1911, 2,354,131 persons, or 32.70 per cent, were dwelling in cities or towns with a population exceeding 5000. In the older parts of the Dominion there is a marked trend of population from country to town, and the urban increase is one of the most striking features revealed by the 1911 census. While during the decade 1901-11 the rural population increased by 576,163, or 17.20 per cent, the urban population increased by 1,259,165, or 62.28 per cent. In the Maritime Provinces and in Ontario the urban population increased at the expense of the

rural, for the latter actually declined, in Prince Edward Island by 10.81 per cent, in Nova Scotia by 7.26, in New Brunswick by 0.58, and in Ontario by 4.18. At the same time, the urban increase was 0.1 per cent in Prince Edward Island, 45.43 in Nova Scotia, 28.81 in New Brunswick, and 41.93 in Ontario. In 1911, Montreal had 14.34 per cent of the urban and 6.53 per cent of the total population of the Dominion; Toronto, 11.48 and 5.22; Winnipeg and Vancouver together, 7.21 and 3.28; Ottawa, Hamilton, and Quebec, 7.55 and 3.44. The 1911 census figures for the larger cities are as follows: Montreal, 470,480; Toronto, 376,538; Winnipeg, 136,035; Vancouver, 100,401; Ottawa, 87,062; Hamilton, 81,989; Quebec, 78,710; Halifax, 46,619; London, 46,300; Calgary, 43,704; St. John, 42,511; Victoria, 31,660; Regina, 30,213; Edmonton, 24,900; Brantford, 23,132; Kingston, 18,874; Maisonneuve, 18,684; Peterborough, 18,380.

Males in 1911 numbered 3,821,995, and females, 3,384,648, the number of females to each 1000 males being 886, as compared with 952 in 1901. The deficiency of females as compared with males is probably greater in Canada than in any other country. The number of females per 1000 males is 888 in Ceylon, 896 in New Zealand, 926 in Australia, 941 in the Union of South Africa, 943 in the United States, 953 in India, 1004 in Ireland, 1017 in Belgium, 1019 in Hungary, 1021 in Holland, 1026 in Germany, 1031 in Switzerland, 1033 in France (in 1901), 1036 in Austria, 1046 in Sweden, 1061 in Denmark, and 1063 in Scotland.

In 1911, unmarried males and unmarried females numbered 2,369,766 and 1,941,886 respectively; married, 1,331,853 and 1,251,468; widowed, 89,154 and 179,656; divorced, 839 and 691; legally separated, 1286 and 1584; not specified, 29,097 and 9363.

Of the total increase in population from 1901 to 1911, viz., 1,835,328, persons of English blood numbered 562,251 (30.63 per cent); Irish, 61,663 (3.36); Scotch, 197,726 (10.77); Welsh, 11,754 (0.06); French, 405,519 (22.09); German, 82,819 (4.51); Austro-Hungarian, 110,925 (6.05). Persons of British origin numbered 3,896,985, or 54.08 per cent of the total population in 1911. English blood made up 25.30 per cent; Irish, 14.58; Scottish, 13.85. Persons of French origin numbered 2,054,890, or 28.51 per cent of the total in 1911; German, 393,320 (5.46 per cent); Austro-Hungarian, 110,925 (1.79); Scandinavian, 107,535 (1.49); Indian, 105,492 (1.46); Jewish, 75,681 (1.05); Dutch, 54,986 (0.76); Italian, 45,411 (0.63).

Of the population in 1911, 5,619,682 (77.98 per cent) were born in Canada; 784,526 (10.89) in the British Isles; 29,188 (0.41) in British possessions other than Canada; and 19,708 persons (0.27 per cent) were of British birth but unknown birthplace. Foreign-born inhabitants numbered 404,941 (10.44 per cent), Europe being the birthplace of 5.62 per cent; Asia, 0.57; the United States, 4.21. Persons born in Austria-Hungary numbered 121,430 (1.68 per cent); Russia, 100,971 (1.40); Germany, 39,577 (0.55); Norway and Sweden, 49,194 (0.68); Italy, 34,739 (0.48); France, 17,619 (0.24); China, 27,083 (0.38); Japan, 8425 (0.12); the United States, 303,680 (4.21).

In 1911, males and females respectively under 5 years of age numbered 448,219 and 439,264; 5 to 14, 749,956 and 733,608; 15 to 24, 737,099

and 649,564; 25 to 44, 1,151,726 and 919,042; 45 to 64, 538,703 and 469,016; 65 and over, 169,605 and 164,158; age not given, 26,687 and 9996; total, 3,821,995 and 3,384,648; total population, 7,206,643. Total estimated population, March 31, 1914, 8,075,000.

Immigrants into Canada during the period 1901-15 numbered 3,050,811. In the year ended March 31, 1915, there were 144,789; in 1914, 384,878; in 1913, 402,432; in 1912, 354,237; in 1911, 311,084; in 1910, 208,794. Of the 384,878 immigrants in the year 1913-14, 66,502 were children, and of the remainder 224,348 were males and 94,028 were females; of the total number, 107,530 came from the United States. Immigrants whose destination was the Maritime Provinces in 1913-14 and 1914-15 respectively, 16,730 and 11,104; Quebec, 80,368 and 31,053; Ontario, 123,792 and 44,873; Manitoba, 41,640 and 13,196; Saskatchewan, 40,999 and 16,173; Alberta, 43,741 and 18,263; British Columbia, 37,608 and 10,127; total, 384,878 and 144,789.

RELIGION AND EDUCATION. Religions numbering 5000 or more adherents in 1911 were as follows:

Religions	Adherents		Increase per cent
	1901	1911	
Adventists	8,058	10,406	29.14
Anglicans	681,494	1,053,017	53.05
Baptists	318,005	382,666	20.33
Brethren	8,014	9,278	15.77
Buddhists	10,407	10,012	-3.80
Christian Scientists	2,619	5,073	93.70
Christians	6,900	16,773	143.09
Confucians	5,115	14,562	184.69
Congregationalists	28,293	34,054	20.36
Disciples	14,900	11,329	-23.96
Doukhobors	8,775	10,493	19.58
Evangelicals	10,193	10,595	3.94
Greek Church	15,630	88,507	466.26
Jews	16,401	74,564	354.63
Lutherans	92,524	229,864	148.43
Mennonites	31,797	44,611	40.30
Methodists	916,866	1,079,892	17.78
Mormons	6,891	15,971	131.77
No religion	4,810	26,027	441.10
Pagans	15,107	11,840	-21.63
Presbyterians	842,442	1,115,324	52.39
Protestants	11,612	30,265	160.64
Roman Catholics	2,229,600	2,833,041	27.06
Salvation Army	10,808	18,834	82.71
Unspecified	48,222	82,490	-24.88
Total of 5,000 and over	5,840,003	7,159,488	34.07

Of the population six years of age and over in 1911, viz., 6,154,511, the number returned as being unable to read was 521,842, or 8.48 per cent. The number of persons between the ages of 5 and 20 at the date of the 1911 census was 2,306,558; of this number, 1,147,838, or 49.76 per cent, attended school for some period during 1910. In general there are two fundamental systems of education in Canada, one that of the Protestant communities, free from the control of religious bodies, and the other that of the Roman Catholic French and Irish communities, in which education is united with the religious teaching of the Roman Catholic Church. In Ontario, Quebec, Saskatchewan, and Alberta, Roman Catholics have the right to form "separate schools" for elementary education, the local rates for the support of these schools being separately levied and applied. In the remaining provinces, there are separate schools for Roman Catholics in the larger cities and towns. In all the provinces, the cost of education is defrayed from the public revenues, provincial and local,

and public elementary education is free except for certain small fees payable in parts of Quebec. Excepting Quebec all the provinces have compulsory education laws. The following table shows, for 1914, number of schools, of teachers, and of pupils enrolled, the percentage of average attendance, and the expenditure for public education (year ended December 31 for Alberta, Ontario, Prince Edward Island, and Saskatchewan; July 31 for Nova Scotia; and June 30 for British Columbia, Manitoba, New Brunswick, and Quebec):

	Schools	Teachers	Enroll.	Av. at.	Expend.
Alta. ...	2,027	3,978	89,910	60.71	\$7,884,891
B. C. ...	682	1,733	58,950	78.97	4,634,877
Man. ...	2,688	2,864	93,954	63.60	6,079,720
N. B. ...	1,922	2,032	64,310	63.57	986,683
N. S. ...	2,724	2,892	106,351	62.60	1,510,079
Ont. ...	6,548	11,546	498,888	64.66	*12,325,907
P. E. I. ...	474	588	18,069	61.81	217,993
P. Q. ...	5,827	7,895	234,260	75.82	7,623,856
Sask. ...	2,966	5,140	118,927	....	8,327,178

* For elementary schools.

AGRICULTURE. The area estimated as under field crops in 1914 was 35,102,175 acres, as compared with 35,375,430 acres in 1913; but owing to the drought the productive area in 1914 was reduced to 33,436,675 acres. Upon this area the total value of all field crops, including roots and fodder, computed at average local market prices, amounted to \$638,580,300, as compared with \$552,771,500 in 1913, the increase of \$85,808,800 being due chiefly to the enhancement of prices caused by the war. The average prices per bushel of the principal grain and fodder crops in 1913 and 1914 respectively were as follows: Wheat, 67 cents and \$1.22; barley, 42 and 60 cents; rye, 66 and 83 cents; oats, 32 and 48 cents; peas, \$1.11 and \$1.46; beans, \$1.88 and \$2.31; buckwheat, 64 and 72 cents; mixed grains, 55 and 66 cents; flaxseed, 97 cents and \$1.03; corn for husking, 64 and 71 cents. For hay and clover the average prices per ton in 1913 and 1914 were \$11.48 and \$14.23; fodder corn, \$4.78 and \$4.91; alfalfa, \$11.85 and \$14.17. Of wheat, the total estimated yield in 1914 was 161,280,000 bushels from a productive area of 10,293,900 acres, as compared with 231,717,000 bushels in 1913 from 11,015,000 acres, the average yield per acre in 1914 being 15.67 bushels, against 21 bushels in 1913. Fall wheat gave a total yield in 1914 of 20,837,000 bushels from 973,300 producing acres, as compared with 22,592,000 bushels from 973,300 producing acres in 1913; average per acre, 23.29 and 21.14 bushels. The yield of spring wheat in 1914 was 140,443,000 bushels, from 9,320,600 acres, the average per acre being 15.07 bushels. In 1913 the corresponding figures for spring wheat were 209,125,000 bushels, 10,045,000 acres, and 20.81 bushels per acre. In the table below are given the area in acres planted to principal crops in 1914, the yield in bushels or tons, and the value:

Crops	Acres	Bushels	Value
Wheat	10,293,900	161,280,000	\$196,418,000
Oats	10,061,500	318,078,000	151,811,000
Barley	1,495,600	86,201,000	21,557,000
Rye	111,280	2,016,800	1,679,800
Peas	205,550	3,362,500	4,895,000
Beans	48,830	797,500	1,844,800
Buckwheat ...	854,400	8,626,000	6,213,000
Mixed grains ...	463,800	16,382,500	10,759,400
Flaxseed	1,084,000	7,175,200	7,868,000
Corn *	256,000	13,924,000	9,808,000
Potatoes	473,900	85,672,000	41,598,000
Turnips, etc. .	175,000	69,003,000	18,934,000

Crops	Acres	Tons	Value
Hay and clover	7,997,000	10,259,000	145,999,000
Fodder corn ..	817,000	8,251,480	15,949,700
Sugar beets ..	12,100	108,600	651,000
Alfalfa	90,815	218,360	8,095,600

* For husking.

Total areas and values of field crops by provinces in 1913 and 1914:

	Acres		Value	
	1913	1914	1913	1914
Alta.	8,690,100	8,369,270	\$46,712,000	\$59,779,600
B. C.	238,700	280,640	11,069,000	11,463,000
Man.	4,965,500	4,671,790	64,557,000	65,528,400
N. B.	906,180	904,055	17,965,100	20,045,100
Ont.	9,200,000	8,973,700	167,835,000	196,220,000
P. E. I.	456,970	461,510	9,535,500	11,544,000
P. Q.	4,898,800	4,863,850	88,589,000	99,279,000
Sask.	10,307,600	9,238,000	129,376,000	152,751,500
TL.	85,375,430	83,486,675	\$552,771,500	\$638,580,300

In the table below are shown the producing area and the yield of wheat, oats, and barley in the Northwest Provinces in 1913 and 1914:

Manitoba:			
	Wheat	Oats	Barley
Acres ...	1913 2,804,000	1,398,000	496,000
	1914 2,616,000	1,381,000	468,000
Bushels .	1913 58,881,000	56,759,000	14,805,000
	1914 58,605,000	31,951,000	9,828,000
Saskatchewan:			
Acres ...	1913 5,720,000	2,755,000	882,000
	1914 5,348,800	2,520,000	290,000
Bushels .	1913 121,559,000	114,112,000	10,421,000
	1914 73,494,000	61,816,000	4,901,000
Alberta:			
Acres ...	1913 1,512,000	1,639,000	197,000
	1914 1,371,000	1,502,000	178,000
Bushels .	1913 84,372,000	71,542,000	6,384,000
	1914 28,859,000	57,076,000	4,806,000

In 1914 the producing area in the Northwest Provinces was reduced by drought to the figures given above by 723,100 acres planted to wheat, 753,000 acres oats, and 102,000 acres barley.

Estimated live stock on farms June 30, 1913, and June 30, 1914, respectively: Horses, 2,866,008 and 2,947,738; milch cows, 2,740,434 and 2,673,286; other cattle, 3,915,687 and 3,363,531; sheep, 2,128,531 and 2,058,045; swine, 3,448,326 and 3,434,261. The 1911 census returned 2,598,598 horses, 2,595,255 milch cows, 3,930,828 other cattle, 2,174,300 sheep, and 3,634,778 swine.

FISHERIES. The stated value of all kinds of fish, fish products, and marine animals taken in both sea and inland fisheries was \$33,389,464 in the year 1912-13, and \$33,207,748 in 1913-14. Value by provinces in 1913-14: Prince Edward Island, \$1,280,447; Nova Scotia, \$8,297,626; New Brunswick, \$4,308,707; Quebec, \$1,850,427; Ontario, \$2,674,685; Manitoba, \$606,272; Saskatchewan, \$148,602; Alberta, \$81,319; British Columbia, \$13,891,398; Yukon, \$68,265.

HOMESTEADS. In 1914 the total number of ordinary homestead entries for lands of the Dominion government was 25,623, as compared with 31,499 in 1913, 35,538 in 1912, and 38,909 in 1911. In 1914, 4205 entries were made in Manitoba (against 2998 in 1913), 9752 in Saskatchewan (against 14,524), 10,772 in Alberta (against 12,122), and 847 in British Columbia (against 1855). The number of preëmptions under the Dominion Lands Act was 3262 in 1914 (2417 in Saskatchewan and 1772 in Alberta). The number of purchased homesteads under the Act was 422 in 1914 (290 in Saskatchewan, 132 in Al-

berta), against 786 in 1913 (534 in Saskatchewan, 252 in Alberta).

MINING. The total value of the mineral production in 1914 was \$128,475,499 (preliminary report of the Dominion Department of Mines), as compared with the finally revised total of \$145,634,812 for 1913. The total value of the metallic production in 1914 was \$58,870,028, as against \$66,361,351 in 1913, the decrease being \$7,491,323, or 11 per cent. Non-metallic products were valued at \$69,605,471 in 1914, as against \$79,273,461 in 1913, the decrease being \$9,667,990, or 12.19 per cent. The decrease was most pronounced in the case of coal, asbestos, and gypsum, and of products generally classed as structural materials, such as cement, brick, sewer pipe, and lime.

Value of the mineral output by provinces, with percentage of totals:

	1913		1914	
	\$	P.c.	\$	P.c.
N. S.	19,376,183	13.30	17,514,786	13.68
N. B.	1,102,613	0.76	1,084,706	0.81
P. Q.	13,475,534	9.25	12,259,687	9.54
Ont.	59,167,749	40.68	52,147,978	40.59
Man.	2,214,496	1.52	2,428,902	1.89
Sask.	881,142	0.60	710,840	0.55
Alta.	15,054,046	10.34	12,778,669	9.94
B. C.	28,086,312	19.29	24,202,924	18.84
Yukon	6,276,787	4.81	5,402,062	4.21
Total	145,634,812	100.00	128,475,499	100.00

The decline in production in 1914 is ascribed in large measure to conditions resulting from the war. The cutting off of markets and the closing of metal exchanges, with the consequent cessation of market quotations, resulted in the closing down or restriction of operation at many properties.

The following table shows the quantities (in thousands) and the values (in thousands of dollars) of minerals produced in Canada in 1913 and 1914:

	Quantities (1000)		Dollars (1000)	
	1913	1914	1913	1914
Copper, lb.	76,977	75,738	11,754	10,302
Gold, oz.	803	770	16,599	15,925
Pig iron, tons	1,129	783	16,540	10,008
Lead, lb.	37,668	36,338	1,755	1,628
Nickel, lb.	49,677	45,518	14,908	13,655
Silver, oz.	31,845	27,544	19,041	15,097
Other metallic products .....	.....	.....	1,214	1,224
Total .....	.....	.....	81,905	67,784
Less pig iron from imported ores, tons 1,055	687	15,544	8,864	
Total metals .....	.....	.....	66,361	58,870
Asbestos & asbestic, tons 161	118	8,850	2,910	
Coal, tons	15,012	13,595	37,335	38,433
Gypsum, tons	686	511	1,448	1,137
Natural gas, M. ft.	20,478	21,047	3,309	3,511
Petroleum, bbls.	228	215	406	343
Pyrites, tons	159	225	521	736
Salt, tons	101	107	491	494
Cement, bbls.	8,659	7,172	11,019	9,188
Clay products .....	.....	.....	9,504	7,091
Lime, bush.	7,558	6,245	1,609	1,248
Stone .....	.....	.....	5,505	5,593
Miscellaneous .....	.....	.....	4,275	3,922
Total non-metals .....	.....	.....	79,273	69,605
Grand total .....	.....	.....	145,635	128,475

COMMERCE. In the table below are shown, for fiscal years, the values in dollars of imports of dutiable merchandise, free merchandise, and

coin and bullion, together with the values of the total imports:

	Merchandise		Coin & Bullion	Total Imports
	Dutiable	Free		
1900 ..	112,943,896	68,381,179	8,297,488	189,622,513
1905 ..	157,164,975	99,361,007	10,308,435	266,834,417
1910 ..	241,961,556	143,873,547	6,017,589	391,852,692
1913 ..	456,086,187	230,518,226	5,427,979	692,032,392
1914 ..	425,324,376	210,186,916	15,235,305	650,746,797
1915 ..	318,951,094	178,500,808	131,992,992	629,444,894

Exports have been valued as follows, in fiscal years:

	Merchandise		Coin & Bullion	Total Exports
	Canadian	Foreign		
1900 ..	168,972,301	14,265,254	8,657,168	191,894,723
1905 ..	190,854,946	10,617,115	1,844,811	203,316,872
1910 ..	279,247,551	19,516,442	2,594,536	301,358,529
1913 ..	355,754,600	21,813,755	16,163,702	393,232,057
1914 ..	431,588,439	23,848,785	23,560,704	479,997,928
1915 ..	409,418,836	52,023,673	29,366,368	490,808,877

Imports of merchandise for consumption and exports of Canadian merchandise, in fiscal years:

	1910	1913	1914	1915
Imps.	369,815,427	670,089,066	618,457,144	455,446,312
Exps.	279,247,551	355,754,600	431,588,439	409,418,836

One of the consequences of the great war was the transfer to Canada, in trust for Great Britain, of gold from the United States. Imports of coin and bullion increased from \$15,235,305 in 1913-14 to \$131,992,992 in 1914-15. Exclusive of coin and bullion, the external trade of Canada in the fiscal year ended March 31, 1915, amounted to \$958,894,411, as compared with \$1,090,948,716 in 1913-14, the decrease being 12.1 per cent. Of the total value, exports amounted to \$461,442,509 in 1914-15, as compared with \$455,437,224 in 1913-14, and imports to \$497,451,902, as compared with \$635,511,492, the increase in the exports being 1.3 per cent, and the decrease in the imports, 21.7 per cent. It should be noted that values were affected by variation in prices due to the war, especially, in the case of exports, to the rise in the prices of grain and flour. It should also be noted that the decline in the value of imports began before the outbreak of the war. For every month of the year ended March 31, 1915, the imports were of less value than in the corresponding month of the previous year.

The principal imports for consumption, in the fiscal year 1914 and 1915 respectively, were as follows, in thousands of dollars: Live animals, 2515 and 1228; books, maps, pamphlets, periodicals, etc., 6754 and 5854; breadstuffs, 9426 and 13,982; carriages, automobiles, bicycles, etc., 20,098 and 8523; coal, coke, etc., 49,036 and 38,620; cotton and manufactures thereof, 37,601 and 27,399; drugs, dyes, chemicals, and medicines, 14,638 and 13,449; earthenware and china, 3131 and 1941; electrical apparatus, 8924 and 6036; fancy goods, 4879 and 3176; fish, 2173 and 1706; flax, hemp, jute, and manufactures thereof, 8963 and 6428; fruits, 17,233 and 15,469; glass and manufactures thereof, 5075 and 3524; rubber, gutta-percha, and manufactures thereof, 8994 and 7767; hats, caps, etc., 5452 and 3789; hides and skins other than fur, 8831 and 12,843; leather and manufactures thereof, 8454 and 7059; total metals, minerals, and manufactures thereof, 148,383 and 84,366; (iron and steel, and

manufactures thereof, 119,322 and 64,759; copper and manufactures thereof, 6581 and 3561; brass and manufactures thereof, 4415 and 2949; tin and manufactures thereof, 6358 and 4791; oils, 17,095 and 13,345; paints and colors, 2161 and 1572; paper and manufactures thereof, 8043 and 5764; provisions, 10,813 and 5935; seeds, 1671 and 2365; settlers' effects, 14,348 and 7864; silk and manufactures thereof, 9689 and 8139; spirits and wines, 7047 and 5331; sugar, molasses, etc., 17,949 and 19,033; tea, 6650 and 7364; tobacco, 6899 and 5801; vegetables, 3307 and 3039; wood and manufactures thereof, 24,676 and 14,506; wool and manufactures thereof, 31,438 and 24,839.

Exports of Canadian produce, in fiscal years, are shown below by great classes, values in dollars:

	1913	1914	1915
Mining prod.	57,442,546	59,039,054	51,740,989
Fisheries prod. . .	16,836,721	20,628,560	19,687,068
Forest prod.	43,225,060	42,792,187	42,650,688
Animal prod.	44,784,593	53,349,119	74,390,743
Agricultural prod. .	150,145,661	198,220,029	184,746,050
Manfd. prod.	48,692,708	57,448,452	85,539,501
Miscellaneous	97,311	121,088	663,802
Total	355,754,600	431,588,439	409,418,836

The following table shows quantities and values of exports of Canadian wheat, oats, all grains, and wheat flour, in fiscal years:

	1913	1914	1915
Wheat, bush.	93,166,009	120,426,579	71,918,885
Wheat, \$	58,608,730	117,719,217	74,293,548
Oats, bush.	10,478,554	84,996,664	17,768,166
Oats, \$	5,067,950	13,879,849	8,961,126
All grains, bush. .	110,571,307	168,929,880	96,573,270
All grains, \$	97,941,844	188,129,261	88,018,283
Wheat flour, bbls. .	4,478,048	4,892,183	4,952,337
Wheat flour, \$... .	19,970,689	20,581,079	24,610,946

Besides cereals, important domestic exports in the fiscal years 1914 and 1915 were as follows, in thousands of dollars: Planks and boards, 19,514 and 18,921; deals, 7957 and 7542; wood blocks for pulp, 7339 and 6817; square timber, 536 and 533; shingles, 1776 and 2988; logs, 818 and 1259; silver, 20,972 and 13,516; gold, 13,327 and 15,407; copper, 9490 and 7545; coal, 3703 and 4466; asbestos, 2892 and 2227; dry salted codfish, 4565 and 4122; canned lobsters, 2984 and 3014; canned salmon, 6631 and 4949; cattle, 7907 and 9266; furs, 5569 and 2758; hides and skins other than furs, 9263 and 7730; bacon and hams, 4033 and 14,465; cheese, 18,869 and 19,214; wool, 647 and 1360; fresh apples, 3465 and 2657; hay, 1787 and 2233; potatoes, 1128 and 697; agricultural implements, 7220 and 2808; carriages, bicycles, etc., 4015 and 3498; iron and steel, 3757 and 11,407; wood pulp, 6365 and 9266; liquors, 1306 and 1102; leather and manufactures thereof, 3214 and 10,807; drugs, dyes, chemicals, etc., 1719 and 3530; household effects, 2841 and 3682.

By principal countries, imports for consumption and total exports in fiscal years have been as follows, in thousands of dollars:

	Imports		Exports	
	1914	1915	1914	1915
United States.	*410,786	*428,617	200,459	215,409
United Kingdom. . .	132,071	90,161	222,323	211,759
France	14,277	8,449	3,811	14,596
Germany	14,586	5,037	4,434	2,162
Belgium	4,490	1,876	4,820	8,259
Newfoundland	1,841	1,245	4,770	4,481

	Imports		Exports	
	1914	1915	1914	1915
South America .. .	9,020	9,394	4,026	2,114
West Indies	11,504	6,998	11,089	6,418

* Coin and bullion included was \$15,220,768 in 1913-14 and \$131,984,421 in 1914-15.

COMMUNICATIONS. The length of railway in operation June 30, 1914, was 30,795. The increase in mileage during the year then ended was 1491, as compared with 2577 in 1913, 1327 in 1912, and 669 in 1911. In the fiscal year 1914, aggregate railway earnings were \$243,083,539, showing a decrease of \$13,619,164, or 5.6 per cent, as compared with the previous year. Operating expenses in 1913-14 amounted to \$178,975,259, showing a decrease of \$3,036,431, or 1.7 per cent, from the total of the previous year. During 1913-14 the sum of \$276,990,069 was added to the capital liability of steam railways in operation, including stocks, \$97,794,137, funded debt, \$169,145,686, and consolidated debenture stock of the Canadian Pacific Railway, \$10,050,246. These additions bring the total capitalization of steam railways in operation to \$1,808,820,761 on June 30, 1914. If the capitalization of railways under construction be added to that of the operating railways, the total is increased to \$1,962,128,070, of which \$917,748,153 are stocks, \$173,307,470 are consolidated debenture stock, and \$871,072,447 are funded debt.

The following table shows the mileage of Canadian steam railways by provinces at the end of fiscal years:

	1909	1913	1913	1914
Ontario	8,229	8,546	9,000	9,255
Quebec	3,663	3,882	3,986	4,043
Manitoba	8,205	8,520	3,998	4,076
Saskatchewan	2,631	3,754	4,651	5,089
Alberta	1,322	1,897	2,212	2,545
British Columbia ..	1,796	1,855	1,951	1,978
New Brunswick	1,547	1,545	1,545	1,839
Nova Scotia	1,351	1,857	1,860	1,865
Prince Edward Island .	269	269	279	279
Yukon	91	102	102	102
In United States .....	....	....	225	224
Total	24,014	26,727	29,804	30,795

The report of the Comptroller of Railways Statistics of the Dominion of Canada, issued in 1915, showed that the operating railway mileage on June 30, 1914, was 30,795 miles, which represented an increase of 1492 miles during the fiscal year of 1914, the greatest annual gain from 1908 to 1914 inclusive, barring 1913, when 2575 were added. Ontario led the provinces with 9255 miles of track; Saskatchewan was second, with 5089 miles, of which 438 were added in 1914. In addition to the lines under operation, 11,472 miles were surveyed throughout the Dominion in 1914. Under contract were 5521 miles, and 3417 were completed but not in operation. The bulk of this mileage was in the western provinces, where Alberta had 805 miles under contract, and 1189 miles completed but not in operation; British Columbia 1235 under contract, and 698 completed; Saskatchewan 340 miles under contract, and 555 miles completed; and Manitoba 108 miles under contract, and 134 miles completed. Ontario had 1841 miles under contract, and 836 completed but not in operation. The capital spent during the year was \$276,990,069, and the total capital expenditure was \$1,808,820,961. The ratio of operating expenses to gross earnings was 73.63 per cent. There

were 150,142 employees, to whom had been paid \$111,762,972 during the year.

During 1915, 718.7 miles of new first track was completed in the Dominion of Canada, and .84 miles of second track. This is a decrease over the record for 1914 and is due to the fact that the European war seriously interfered with all construction activities. The 718 miles of line completed was nearly all work which was far advanced. Thus the Pacific Coast extension of the Canadian Northern was placed in service during the year. On other lines the extension had taken place so rapidly in other years that there was no necessity for great extension, especially in Western Canada, as in many districts the railway facilities were in advance of the settlement of the country. The Canadian Pacific western lines, which reported a total of 574 miles built in 1914, reported only 23 miles opened in 1915.

On Nov. 22, 1915, the Canadian Northern Railway ran the first train on its Pacific Line from Edmonton to Vancouver, B. C., thus making the third Canadian transcontinental railway to be in operation. The Canadian Northern Railway follows the valley of the Athabasca and Miette rivers to the summit of the Yellowhead Pass, whence it runs westerly along Yellowhead Lake down the Fraser River and across the head of Cranberry Lake, beyond which it rises to the Albreda Summit at an elevation of 2861 feet. Thence it follows the Albreda River to the North Thompson, which it runs along with as far as Kamloops, and thence the Thompson River to Lytton, and the Fraser River to the coast. From Kamloops the new line parallels the Canadian Pacific Railway. The railway company has established a new city and port at Port Mann, but the line runs beyond this to Vancouver, whence a car ferry will transfer across to Patricia Bay on Vancouver Island, so that track connection can be maintained with Victoria, B. C., making this the terminal port for the Pacific steamers instead of Vancouver. The Pacific Coast section of the three Canadian transcontinental railways is as follows:

Railway	Winnipeg to	Miles	Max. Elev. Ft.	Max. Grade P.c.
Can. Northern	Vancouver	1,610	8,711	0.7
Grand Trunk Pac.	Prince Rupert	1,754	8,724	1.0
Canadian Pacific	Vancouver	1,484	5,321	2.2*

* Reduced from the original grade of 4.2 per cent.

FINANCE. The system of Canadian public finance includes a consolidated fund and miscellaneous accounts. To the consolidated fund are paid in the revenues, and out of it are paid the expenditures, properly relating to the fiscal year. The miscellaneous accounts comprehend loans, debt redemption, railway administration, capital expenditure on public works, etc. For fiscal years ended March 31st, the expenditure and the revenue of the Dominion government are shown in the following table. The several items are indicated as follows: *a* expenditure chargeable to consolidated fund; *b* expenditure chargeable to capital; *c* railway subsidies; *d* other charges; *e* total disbursements; *f* revenue on account of consolidated fund; *g* other revenues; *h* total revenue; *i* difference between receipts and disbursements; *j* sinking funds; *k* net difference between receipts and disbursements.

	1910	1912	1913	1914
a	\$79,411,747	\$98,161,441	\$112,059,537	\$127,384,473
b	29,756,353	30,989,576	27,206,046	37,180,176
c	2,048,907	859,400	4,935,507	19,086,237
d	4,179,577	7,181,665	255,787	2,640,162
e	115,895,774	137,142,082	144,456,877	186,241,048
f	101,503,711	136,108,217	168,689,903	163,174,395
g	112,765	.....	524	.....
h	101,616,476	136,108,217	168,690,427	163,174,395
i	3,779,298	1,088,865	24,283,550	23,066,658
j	1,441,081	1,156,456	1,884,285	1,371,429
k	*12,388,267	†122,591	†26,617,885	*21,695,224

* Net excess of expenditure † Net excess of receipts.

Receipts from customs in 1912-13 and 1913-14 respectively, \$111,764,699 and \$104,691,238; from excise, \$21,447,445 and \$21,452,037. The interest on the public debt in 1912-13 was \$12,605,882, and in 1913-14, \$12,893,505. The public debt, March 31, 1914, was \$544,391,389; assets, \$208,394,519; net debt, \$335,996,850.

ARMY. The Ministry of Militia, under Gen. Sir Samuel Hughes, K. C. B., had been actively engaged since the outbreak of the war in recruiting, equipping, and sending forward the volunteer forces of the Dominion. The annual expenditure in 1915 in this respect was estimated at some \$175,000,000. The army service corps had transported 114,249 men of all ranks since the outbreak of the war, and 26,562 remounts had been purchased, of which 23,155 had been shipped to Europe. The Canadian Ordnance Corps had purchased 600,000 pairs of boots, 400,000 caps, 600,000 shirts, 600,000 suits of underclothing, 49 armored cars, 1800 transport wagons, 280 other transport vehicles, 6000 sets of harness, 350 motor trucks, 40 ambulances, 143 motor cycles, 1400 bicycles, 8700 binoculars, 3850 telescopes, 110,000 Ross rifles, 500,000 automatic pistols. The expenditures for horses had totaled \$4,163,000. Ocean transport of troops and supplies \$6,780,000. To the Shell Committee \$5,000,000 had gone for shells for the Canadian artillery, and other expenses had been in proportion. The Canadian Defence Ministry decided that the volunteer army of Canada in the field should be increased to a maximum of 500,000 men, which would require the enlistment of some 275,000 more men, and would doubtless involve an annual expenditure for military purposes alone of \$400,000,000.

The Canadian losses for the first contingent as reported were 1213 killed, 5230 wounded and 1565 missing. Up to October 16th the number of casualties totaled 667 officers and 14,510 enlisted men. The Canadian infantry regiments fighting in Belgium suffered severely, and of 12 infantry battalions engaged in the three days fighting around Ypres over 70 per cent were killed or wounded, so that replacements were necessary, which in the main came from promotion on account of the enlisted personnel. It was proposed to start an officers' training school at Niagara. It was reported early in the year that 30,000 of the Canadians were in Belgium, another 30,000 ready to sail, and a third contingent was making ready. Later in the year the Canadian Minister of Militia announced that an effort would be made to raise 27 additional regiments of infantry, and six batteries of artillery, or about 35,000 men, which would bring the Canadian forces to about 150,000.

Little difficulty was experienced in recruiting the volunteer organizations, and many unemployed and college students were anxious to enlist. The second contingent of volunteers was delayed on account of outbreaks of contagious diseases in the training camps, and criticism was heard of mismanagement and faulty supplies.

NAVY. The Naval Service Department was established in 1910, and subsequently programmes of construction were introduced but failed of enactment. The only ships of fighting value are the cruisers *Niobe* (11,000 tons) and *Rainbow* (3000), and two submarines. The submarines had been completed in 1914 for Chile, and soon after the outbreak of the war they were purchased by Canada and, together with the cruisers, placed at the disposal of the Imperial government. There are a number of small vessels for fishing protection duty, revenue and surveying services, etc.

GOVERNMENT. The executive authority is exercised in the name of the King of Great Britain and Ireland by an appointed Governor-General acting through a privy council, or responsible ministry. The legislative power is vested in a Parliament of two houses, the Senate and the House of Commons. Senators, nominated for life by the Governor-General, are 87 in number; in the next Parliament they will number 93. Members of the House of Commons—now 226 in number—are elected by popular vote and hold office for five years unless the Parliament is sooner dissolved; in the next Parliament they will number 234, apportioned as follows: Quebec, 65; Ontario, 82; Prince Edward Island, 3; Nova Scotia, 16; New Brunswick, 11; Manitoba, 15; Saskatchewan, 16; Alberta, 12; British Columbia, 13; Yukon Territory, 1. The Governor-General in 1915 was Prince Arthur, Duke of Connaught (brother of Edward VII), who assumed office Oct. 31, 1911. The Conservative ministry of Sir Robert Laird Borden, which succeeded the Liberal ministry of Sir Wilfrid Laurier Oct. 10, 1911, was composed as follows in 1915: Premier and president of the council, Sir Robert Laird Borden; minister of trade and commerce, Sir George Eulas Foster; public works, Robert Rogers; railways and canals, Francis Cochrane; finance, William Thomas White; marine and fisheries, John Douglas Hazen (also minister of the naval service); justice, Charles Joseph Doherty; militia and defense, Sir Samuel Hughes; interior, William James Roche; labor, Thomas Wilson Crothers; customs, Dr. John Dowsley Reid; agriculture, Martin Burrell; mines, Pierre Edouard Blondin; inland revenue, Esioff Léon Patenaude; ministers without portfolios, Sir George Halsey Perley, Albert Edward Kemp, and James Alexander Loughheed; postmaster-general, Thomas Chase Casgrain; solicitor-general (not in the Cabinet), Arthur Meighen.

Each of the provinces has an elected Legislature, and an executive (Lieutenant-Governor) appointed by the Governor-General and acting through a responsible ministry.

HISTORY

RELATIONS WITH THE UNITED STATES. Relations between the United States and Canada remained friendly throughout the year, notwithstanding the fact that on several occasions com-

plications of a serious nature arose. The most serious of these questions was the "Niagara Fisheries" case. On Dec. 28, 1914, two American citizens, Walter Smith and Charles Dorsch, both of Buffalo, N. Y., rowed across the Niagara River at Buffalo and began to fish in Canadian waters at Fort Erie. Provincial Constable T. W. Delaney demanded that the young men come ashore and surrender and when they began to row in the opposite direction he called upon Corp. Archie Kay and Privates Kinsman and McIntosh for assistance. An order was given to fire in the air in the direction of the boat, but two shots went true, killing Smith and seriously wounding Dorsch. The coroner's jury rendered a verdict of accidental shooting, but the families of the two men appealed to the American government for redress. On January 7th Canada voluntarily accepted blame for the shooting. This action was taken on the initiative of the Ottawa government before the American government had time to enter a protest. On January 22nd, at the same time that the Ontario provincial government made preparations to prosecute the soldiers, the Dominion government announced that it would defend them on the advice of the war department. Under an agreement reached at Washington on February 1st Canada paid \$10,000 to the family of Smith and \$5000 to the family of Dorsch and expressed regrets for the incident. At the same time the Dominion government held that such action on her part was entirely voluntary and that it in no way admitted responsibility for the incident. On March 2nd the grand jury at Welland, Ont., returned no bill against the constable and soldiers who were being tried in connection with the Fort Erie case. This ended the matter which for a time caused great excitement along the Canadian and American frontiers.

VAN HORN CASE. Another complication of international importance was the Van Horn case. On February 2nd Werner Van Horn, a German reservist officer, endeavored to blow up the Canadian Pacific Railway Bridge crossing the St. Croix River at Vanceboro, Me. Early in the morning Van Horn crossed to the Canadian side of the bridge and planted a charge of dynamite. The explosion of the charge did little damage to the bridge, but wrecked windows in all the buildings in Vanceboro. Van Horn was arrested, and Canadian authorities put in an application for his extradition to Canada. The prisoner resisted the demand for extradition on the ground that he was a German army officer, had committed an act of warfare against Canada, and was, therefore, a political prisoner and not subject to extradition. The American authorities were inclined to believe that Van Horn could be extradited by means of a clause in its treaties with Canada which provides for extradition of persons who attempt to destroy railroad bridges, or that if this course failed he could be tried on the charge of violating American neutrality. Awaiting a decision on these matters, Van Horn was sentenced to 30 days in jail for breaking windows in Vanceboro by means of his dynamite charge under the bridge. On February 4th the German Embassy took notice of the proceedings, the counselor of the Embassy calling at the State Department in Washington for details of the charges against Van Horn. Late in the month the Federal Grand Jury in Boston took up the case to see if it

would be possible to charge Van Horn with having carried explosives illegally from one State into another. On March 2nd he was indicted by the Grand Jury on three charges of this nature. In the meantime Captain Boy-Ed, German naval attaché, was accused of instigating Van Horn in his attempt to destroy the railway bridge. Captain Boy-Ed claimed the rumor to be without foundation. The prisoner was transferred to Federal jurisdiction on March 7th and taken to Boston to stand trial on the charges named in the indictment. Van Horn contested his removal, but a Federal commission decided against him. Counsel for the prisoner also tried to obtain a writ of habeas corpus, but this was denied by two Federal judges. Several postponements of the case finally brought it to the September session of the Federal courts. On August 17th an Eastern newspaper printed the story of an alleged confession of Van Horn. This confession implicated leading German officials. Van Horn denied its authenticity, but the newspaper insisted that the original of the confession was in the hands of the Department of Justice in Washington. On September 28th Van Horn took appeal from the Federal decision charging illegal transportation of explosives from State to State. Van Horn questioned the regularity of the extradition proceedings and the refusal of the court to permit him to invoke the law of nations, or present his commission as an officer in the German army, while he also claimed a general error on the part of all the judges and magistrates who had been connected with the case.

The Canadian government decided to await the result of the United States' action against Van Horn before pushing the Canadian claims for his extradition.

TRADE RELATIONS WITH THE UNITED STATES. A rumor circulated late in January charged Canada with boycotting American goods. This rumor was indignantly denied by the Canadian government, although it was generally admitted that Canadians were offended because the United States had taken no action in the case of Belgium or the *Lusitania*. On September 23rd Canada issued an unusual order when she threw open Canadian ports on the Great Lakes to ships of American or other registry. Previously Canada had compelled all ships in the carrying trade to bear Canadian registry. The necessity of removing the grain, however, from the Superior region to the Atlantic coastline and the shortage of Canadian ships, due to the number which were being used in transporting munitions to Europe, made it necessary for the Dominion government to let down the barriers which previously had kept American ships out of this lucrative trade.

ECONOMIC CONDITIONS IN CANADA. The European war had a far-reaching effect on the internal conditions of the Dominion. Its greatest effect was on the finances of the country. Early in January the city of Montreal found it necessary to issue bonds for nearly \$7,000,000, part of which were bought by New York financial houses. In the middle of January the Province of Alberta listed \$5,000,000 of 4½ per cent ten-year debentures on the New York Stock Exchange. This was the first time in the history of the relations between the United States and Canada that Dominion bonds had been listed on the exchange. Early in February a New York

financial firm purchased \$5,475,000 in 5 per cent bonds of Manitoba. On March 29th announcement was made in London of a Canadian loan of £5,000,000, secured by five- and ten-year bonds. On July 22nd the Dominion government sold \$45,000,000 of 5 per cent notes to a New York syndicate. Of this amount \$25,000,000 was to run for one year, and the rest for two years. It was the first time that the Canadian Dominion government ever had made a loan in the United States. That the people of the United States had faith in their Canadian neighbors was shown by the fact that within three days the loan was three times oversubscribed. In the middle of September the National City Bank of New York loaned \$2,500,000 in a private transaction to the city of Toronto. In November the Dominion government floated a war loan of \$50,000,000, which was oversubscribed by \$60,000,000. The Canadian banks were in a much stronger position by September than they had been the year previous, and were able to offer better credit accommodation to grain and other brokers. By the Canadian Finance Act of 1914 (see YEAR BOOK, 1914) the banks were able to create additional liquid capital by issuing Dominion notes against grain bills, warehouse receipts, and other paper securities. A proposal in January to increase Canadian freight rates in comparison with an increase on American roads met with objections on the part of the government. In the last of March the Dominion government took over the operation of a railroad line running from Moncton, N. B., to Winnipeg, Man., a distance of 1800 miles. This road was built by the government for the Grand Trunk Pacific, which later declined to take over the lease. The decision on the part of the government to operate the road itself delayed a crisis which for a time appeared inevitable in Canadian railroad affairs. It appeared probable, however, that eventually the government would be compelled to take over several of the unprofitable roads which were constructed through barren parts of the country at a time when the financiers had a craze for railroad construction.

The Canadian government on November 27th commandeered all of the wheat in the district between Fort William on Lake Superior and the Canadian coast, a total amount of approximately 25,000,000 bushels. This was commandeered for government purposes, and to prevent it from getting into the hands of the enemies of Canada. Three days later, in response to the complaints of many dealers who had large contracts which could not be filled if all the wheat in the east was held up, part of the wheat was released for 60 days on condition that the dealers return it when requisitioned.

PARLIAMENT. Unusual methods were taken in February to protect the Duke of Connaught, Governor-General of Canada, at the opening of Parliament. At the first meeting on February 8th the Opposition announced that it would not object to the passage of war funds but that it would insist upon a strict accountance for the expenditures already made. On February 11th the government announced a drastic war taxation measure, affecting bank circulation, business of loan and fire insurance companies, business and banking transactions, railway and steamship tickets, telegraph and cable messages, and patent medicines. An increase in tariff duties was laid on all imports, although British

products were given a preferential rate. This increase in rates was expected to produce an extra \$30,000,000 of revenue which would partially offset the deficit of \$100,000,000 brought about by the war. The War Revenue Act was signed on April 8th and went into effect on April 15th. Parliament was prorogued on the same day. The Duke of Connaught, in closing the session, said:

"There is no abatement in the intense determination of the Canadian people to unite their efforts with those of all other British domains for the maintenance of the empire's integrity and for the preservation of its institutions and liberties. The response to the call for men has fully equaled all our anticipations. I have been proud to learn that the Canadian soldiers have shown conspicuous bravery and efficiency on the field of battle."

CANADA'S SHARE IN THE WAR. The first contingent of troops which Canada had sent to England was called to the firing line in France, January 30th, while the second contingent was already prepared in Canada, awaiting orders to embark for Great Britain. The first contingent received its baptism of fire the day after it reached the front, January 31st, when Princess Patricia's Light Infantry regiment helped the British defend the trenches near La Bassée. In March the second contingent sailed from Canada, to undergo a brief period of training in England and then to be sent to France. The Canadian troops distinguished themselves by their gallantry in the battle of Ypres (see *WAR OF THE NATIONS, Battle of Ypres*); for conspicuous acts of bravery at Ypres the Victoria Cross was presented to three Canadians—Captain Francis Sorringer of the Army Medical Service, Color Sergeant Fred Hall of the 8th Canadian battalion, and Corporal Fred Fisher of the 13th Canadian battalion. In May, the White Star liner *Megantic* carried a third division of soldiers to Europe. The Strathcona Horse and the Royal Canadian Dragoons were dismounted early in May and sent to France in conjunction with an English cavalry company as unmounted cavalry. More than 6000 Canadian troops had been killed, wounded, or captured at the battle of Ypres in May; by June this number had been increased to 8000; and by August the total casualties were well over 10,000. By October, Canada had in actual service over 100,000 troops, with 75,000 more in Canadian training camps waiting to be called to the front. The maximum of 150,000, which had been placed upon the number of Canada's overseas forces, was raised to 200,000 by the authority of the Dominion government, October 29th. The entire country responded to the appeals for more men to aid the cause of the Allies. In a majority of Canadian cities buildings and vehicles were placarded with patriotic posters demanding that Canada do her share of the fighting. McGill and other universities undertook to train student recruits and send them to the front. Volunteers who could not yet enlist for active service were given a preliminary military training in the summer camps which were established at Aldershot (N. B.), Sussex (N. B.), Valcartier (Que.), Barriefield, Niagara, and London (Ont.), Sewell (Man.), and Vernon (B. C.). Furthermore, a Canadian firm at Montreal, in January, began to construct submersibles for the Allies, and in July was able to send ten of these craft across

the Atlantic under the escort of two auxiliary cruisers.

GERMAN PLOTS IN CANADA. Numerous conspiracies on the part of Germans and Austrians in Canada were discovered and frustrated. Carl Mackensen, nephew of the famous German general of the same name, was arrested in Vancouver, B. C., January 14th, by order of the Canadian military authorities, who suspected him of treasonable activities. Mackensen and a German lawyer of Vancouver were lodged in jail pending the decision of their case. Later, in January, nine German prisoners of war escaped from the Halifax Citadel; four were recaptured, but the others eluded pursuit. As a precaution against German attempts to blow up Canadian shipping, the Dominion government issued orders to ships not to enter the port of Halifax or Quebec in case the warning signal of three red balls or lights in a vertical line was displayed. At the same time the government ordered all lights out in the Parliament buildings, Rideau Hall, the home of the Governor-General, and the Royal Mint, for fear of a night attack by aeroplanes, several of which had been seen to leave the American shore of Lake Ontario. The Dominion government also ordered a double watch at the Canadian end of the international bridge at Niagara Falls. In April an unofficial warning reached Canadians that the Atlantic coast was to be attacked by a German fleet. To meet this rumored attack it was reported that 44 British and French ships were dispatched to patrol the Atlantic coast of Canada as well as the Island of Newfoundland. It also was feared that the Germans might attempt to establish a submarine base on the Canadian coast to prey on British commerce in the Atlantic. Mobs in Victoria, in May, wrecked several German-owned buildings in avenging the destruction of the *Lusitania* and compelled the government to place the city under martial law before order could be restored. An attempt of 10 Austrians to blow up the Canadian Pacific Railway Bridge at Smiths Falls, Ont., on May 25th, was frustrated by soldiers, and the Austrians were taken into military custody. On the same day Vancouver interned 115 Austrians and Germans who had been employed for a year as strike-breakers in the Cumberland, Southfield, and Nanaimo mines. (See also the paragraph in this article on the *Van Horn Case, supra*.)

Regarding the exposure of corrupt political practices in Manitoba Province, see separate article on MANITOBA.

CANALS. At the end of 1915 it was authoritatively stated that one more season would finish the Champlain Canal of the New York State Barge Canal system, and also a channel from the Hudson River to Lake Ontario, via the Erie and Oswego branches. On each of these units there was a single unfinished and unawarded contract. The ratification at the November, 1915, election of the \$27,000,000 bond issue for the completion of the whole improvement made it possible to push the work on these remaining two contracts, together with that on the few others not quite completed, provided the Legislature took steps for the immediate issuing of the bonds. At the end of 1915 the Erie Canal west of the Oswego junction contained several uncompleted parts. Legal complications were largely responsible for the unfinished condition. On this section there were numerous railroad

crossings, causing delays both in coming to agreements with the railroads and in performing the work so as not to interrupt traffic. Taking into consideration the amount of work remaining and especially the number of crossings, Mr. Williams, the State engineer, expressed the opinion that two seasons would be required to complete the western half of the Barge Canal.

With the approach of completion of the canal proper much attention was being paid to the matter of terminals. A large number of contracts had been awarded for the various terminals, and on many of these work was in progress. About the city of New York the terminals selected were on the east side of the East River just north of the Queensboro Bridge, on the east side of the Harlem River just north of the Fourth Avenue Railroad Bridge, and at the foot of Camelia Street, Hallett's Cove in the East River, and on the south side of Flushing Bay in the Borough of Queens. A terminal was also in progress of construction at Gowanus Bay in Brooklyn, and plans were developed for one at Newtown Creek or Greenpoint. The canal authorities were also proceeding with the acquirements on Manhattan Island of piers in the East River, and a canal basin at 52nd Street and the North River. Throughout the State progress was being made on the various local terminals.

CAPE COD CANAL. Since the opening of traffic on the Cape Cod Canal, Aug. 1, 1914, to Dec. 31, 1915, there passed through the canal 9000 vessels. Up to Oct. 1, 1915, the canal was unavailable for vessels drawing more than 18 feet, but since that date the large heavy tows, most of which are used in the transportation of coal, steamers drawing 20 feet, and some 90 per cent of the schooners engaged in the coast coal and lumber trade were using the canal. A large number of government vessels, mainly gunboats, destroyers, and submarines, also passed through the canal during the year.

CANALS AT SAULT STE. MARIE. The season of 1915, for the United States canal, opened April 17th and closed December 20th, and that for the Canadian canal, opened on April 13th and closed December 16th. In this time 21,233 vessels of a registered net tonnage of 56,399,147 passed through both canals, 16,910 using the American canal, and 4323 using the Canadian, the registered tonnage being 47,918,847 for the American, and 8,480,300 for the Canadian. This was an increase of 2516 vessels, or 13 per cent over the total traffic for 1914, when 18,717 vessels passed through the canals, with a total tonnage of 41,986,339. The total freight in 1915 was 71,290,304 short tons, as compared with 55,369,934 in 1914. The most important item of cargo east-bound in 1915, as usual, was iron ore, of which 45,212,104 short tons passed through the canals, and 255,481,558 bushels of wheat.

During the year progress was made on the new work at the United States canal, Sault Ste. Marie, Mich., and at Lock No. 4 the excavation was completed, and work commenced by the contractors for the masonry. The new lock is parallel with and a duplicate of Lock No. 3. It is 1350 x 80 feet, with from 24½ to 25 feet of water on the sills. The filling culverts extend under the floor of the lock for its full length, and the emptying culverts extend from its lower end to discharge beyond the lower gates. These culverts were to have butterfly valves operated by hydraulic cylinders. The steel lock gates

of this canal are to be operated by electric winding engines.

LAKE WASHINGTON CANAL. During the year, Lake Washington Canal, at Seattle, Wash., was virtually completed. This canal extends from Puget Sound to Lake Washington, a lock being located about a mile inland from the main waters of the Sound. Salmon Bay, immediately above the lock, has a basin about a mile in length, and Lake Union begins about 2½ miles above the lock, the two being connected by a canal nearly 1½ miles long. The tidal range at this point is approximately 17 feet, and at Salmon Bay a basin or lock is formed about 16½ feet above mean tide, or only 8 feet above high tide, with its bottom from 24 feet to 32 feet below high tide. At this point there is a lock 80 x 825 feet, with one lift, so that Salmon Bay affords a non-tidal basin of approximately the same area as the Royal Victoria and Albert docks of London, on the shores of which various industrial establishments are to be located.

THE DALLES-CELILO CANAL, which opens the Columbia River to light draft vessels as far up stream as Priest Rapids on the main river above Pasco, and to Lewiston, on the Snake River (Idaho), was completed in the spring of 1915, and a formal opening was held May 3rd to 8th, a fleet of river boats passing down from Lewiston to Astoria, touching at intermediate points, and participating in the numerous celebrations which marked the dedication and formal opening. The canal is about 8½ miles in length, and overcomes a fall varying from about 82 feet at low water, to 45 feet at high water. The cost of the work was about \$5,000,000.

NEW ILLINOIS CANAL. The Illinois Legislature during 1915 passed the Illinois Waterway Bill providing for the expenditure of \$5,000,000 for the 65-mile, 8-foot waterway from Joliet to Utica. This canal will start at the end of the Sanitary District Canal and will follow the route of the old Illinois and Michigan Canal for a distance of 15 miles to Dresden Heights. At Dresden Heights an alternative plan is provided of following the Des Plaines River instead of the canal, in case litigation involving a privately owned dam site is decided in favor of the State. From Dresden Heights to Utica the Illinois River will be followed, except for a distance of 3 miles at Marseilles, where a new channel will be dug in order to get around the privately owned dam at that point. From Utica south to the Mississippi the Illinois River now is navigable. The proposed canal will in general follow the Illinois River and will have seven locks. Surveys were in progress during the year and it was estimated that two years would be required to complete the work.

OHIO RIVER IMPROVEMENTS. The Federal project for providing 9-foot slack water navigation for the Ohio River involves the construction of 53 locks and dams at a total cost of \$47,000,000. Up to 1915, 31 of these locks and dams had been completed or were under construction, and the construction of the remainder will be begun within two years. The extensive improvements to the Louisville and Portland Canal were nearing completion, so that the canal by the "Falls of the Ohio" would be in operation some time during the following year. The improvement consisted principally in widening the canal from 86½ feet to 200 feet, in building a new lock 600 feet in length and 110 feet in width, alongside

of the old locks, and in the renewal of the two existing swing bridges, one being replaced by a swing bridge 275 feet in length, and the other at 18th Street over the canal proper at Louisville by a Strauss direct lift bridge spanning the entire width of the canal. The new lock is of Standard Ohio River plan dimensions, 110 x 600 feet, and permits passage between the two pools which the river here forms. The difference in level varies from 27 feet, depending upon the height of water. The new lock has a lift at low water, above and below, of 27 feet; with the present dam up, a lift of 27 feet; and with the proposed new dam up, of 40 feet. It represents the most massive concrete construction, and possesses the practical advantage of permitting the coal barges to pass through in groups of three in line and four abreast.

NEW JERSEY SHIP CANAL. The ship-canal route across New Jersey, surveyed by the Federal government a few years previously, was to be permanently marked by the New Jersey Board of Commerce and Navigation. A survey party was engaged in placing monuments along the centre line. The canal is to extend from Bordentown, on the Delaware River, to Morgan, on Raritan Bay—about 33 miles, the route from Bordentown to Jamesburg having been previously surveyed. The State is to purchase the right of way for the canal, according to a resolution of the New Jersey Legislature in 1911. The type of canal recommended by a special board of United States army engineers, in its investigation of inland waterways, was a sea-level canal of 25 feet depth and 125 feet bottom width. The estimate of cost was \$45,000,000.

PITTSBURGH-LAKE ERIE CANAL. During 1915 Governor Brumbaugh of Pennsylvania appointed a new Lake Erie and Ohio River Canal Board to replace the old board which went out of existence in May after preparing a report on the prospects and design of a canal to connect the Pittsburgh district with Lake Erie. The new board was to complete the estimates of cost made by its predecessors. It was proposed that at the spring elections the issue of bonds to provide for the construction should be passed on by the people of the State, so that if the expenditure was authorized the canal board could start the actual construction of the canal in 1916-17. The waterway, it was asserted, could be built in five or six years, making allowances for legal holidays, though the actual work would consume only four years. The canal could be in operation in 1921 or 1922, and by that time the Ohio River would be deepened to Cairo, and, with the Erie Canal open in New York, Pittsburgh and Western Pennsylvania could reach 27 States and Canada by water transportation.

WELLAND CANAL. With the completion of the Panama Canal the most important waterway for ships under construction was the enlarged Welland Ship Canal in Canada upon which the Dominion government was expecting to spend some \$50,000,000. The canal so far as its length is concerned will not be notable, but its lock system will be unique in that it will have a higher lift than any ship canal so far constructed. The locks are to have a clear inside dimension of 80 x 800 feet, with 30 feet of water on the sills, while each of them will have the great lift of 46½ feet. At Thorold a flight will be constructed rivaling that at Gatun, for, though the locks themselves will not accommo-

date as big a vessel, the lift will be greater. There will be three locks in the flight, each with a lift 46½ feet, or a total lift of 139½ feet. This flight of locks will be double, one side for upbound and the other for downbound vessels. One of the unusual features of the construction will be the use of swinging single-leaf gates. The new harbor at the Lake Ontario entrance was well under way at the end of the year with the entrance piers and embankments, while much had been done toward widening and deepening the existing canal.

EUROPEAN CANALS. A canal between the Vistula and the Oder, large enough for 450 ton barges of 4 feet 8 inches draft, was opened for traffic in April, 1915. It is 182 miles in length and extends up the Warthe and the Netze rivers. The summit level for 16.8 miles is in an old and smaller canal whence the new waterway descends the Brahe to the Vistula. The total lift on the east side is 157½ feet and on the west side 92 feet.

It was proposed during 1915 that an investigation be made of a proposed waterway between Sweden and Norway, through the Strom water-course and the Kvarnsberg lakes. This would make possible the shipment of Swedish exports via a Norwegian Atlantic port, and at the same time it would facilitate the transport of products from West Norway to North Sweden. The important ore deposits which have recently been found on the Norwegian frontier, and not far from the Kvarnsberg lakes and also on the Swedish side, cannot be exploited unless improved means of transport are provided; and the proposed canal system would present an adequate solution.

One of the projects suggested by the great European war was the establishment of a waterway between the North Sea and the Indian Ocean via the Black Sea. A waterway for large vessels between the Rhine-Main on the one side and the Danube on the other for years had been urged as an industrial and commercial necessity not only for Bavaria but for the whole of Germany, which has devoted much attention to its internal waterways. The canalization of the Main as far as Aschaffenburg had been undertaken, and the extension of this canalization as far as Hamburg was under contemplation before the war, but no time had been determined upon for taking up the work. The Bavarian Canal Union, on October 25th, laid the matter before the Chancellor, asking that special interest might be devoted to the completion of the Main-Danube waterway. The proposed canal was important both as a commercial and a military measure, as it would provide an outlet for German manufactures that could not be stopped by the British navy.

CANARY ISLANDS. A group of islands off the northwest coast of Africa, constituting a province of Spain. Area, 7273 square kilometers (2808 square miles). The census of Dec. 31, 1910, returned a population of 444,016; estimate of Dec. 31, 1913, 469,768. The capital, Santa Cruz de Tenerife, had 63,004 inhabitants in 1910; Las Palmas, the most important town, had 60,338. Potatoes, bananas, onions, tomatoes, and nuts are exported.

CANCER. Some remarkable studies on the heredity of mouse cancer were published by Maud Slye in 1914 and 1915. The work of this investigator seems to show that cancer is trans-

missible from generation to generation, strictly in line with the laws of heredity, and it can be bred in and out of mice at will. The stock of ten thousand mice, representing ten generations, now under observation, shows almost constant development of spontaneous cancer. The immense amount of evidence accumulated warrants the belief that the tendency to develop cancer is transmissible. The lesson drawn by Miss Slye is that, since cancer is not transmitted itself, but is likely to arise (probably as a result of local irritation) in individuals with a marked heredity tendency, such individuals should be careful to avoid overirritation of tissue in which cancer is likely to develop. The eugenic control of marriages in which a pronounced cancer history is present on both sides, would do much to decrease the frequency of this scourge. The drug treatment of cancer—chemotherapy—has not realized the hopes which the work of Ehrlich, Wassermann, and others seemed at first to justify. It is a rare year which does not witness the exploitation of at least one cancer cure. The treatment which attracted most attention during 1915, and which was exploited in the newspapers, is known as the Horowitz-Beebe treatment. The specific is called autolysin and originated with an Austrian biologist and chemist named Horowitz. Although the exact composition of the serum was not disclosed, it was said to be a mixture of the following plants: *menyanthes trifoliata* (commonly known as buckbean); *melilotus officinalis* (the common yellow sweet clover); *mentha crispa* (a European variety of mint); *brassica alba* (white mustard); *anemone* (a common spring flower sometimes called liver leaf); *viola tricolor* (pansy); *anthemis* (Roman camomile); *fructus colocynthidis* (colocynth); *lignum quassia* (quassia); *urtica dioica* (nettle); rhubarb root; and hedge hyssop. The medicine was used both as a poultice and an injection. The "cure" was short lived. See also AUTOLYSYN.

The Public Health *Bulletin* of the Massachusetts Department of Health says that statistics give a higher mortality from cancer for New England than for any other group of States, and each separate State has a higher mortality than the general rate of 78.9 per hundred thousand in the entire registration area of the United States. In Maine the mortality is 107.5; New Hampshire, 104.4; Vermont, 111.7; Massachusetts, 101.4; Rhode Island, 93.3; and Connecticut, 85.1 per 100,000. The census of 1913 is the basis for these figures, and they show that 6817 persons died of cancer in New England during that year. English statistics for the same year indicate that cancer is increasing in Great Britain. The death rate among males was 947 per million, among females 1155 per million. The conspicuous facts in the registrar-general's report are first, the constantly increasing mortality in the European population, particularly among males; second, that the excessive female mortality is greater among individuals from 25 to 55.

In the United States Beitler has made a study of the cancer mortality in the registration area during the decade from 1904 to 1913, and finds that the number has increased from 23,295 in 1904 to 49,928 in 1913, an increase in the rate from 70 to 79 per 100,000. This increase applies not only to the number of deaths, but to the death rate, which is 12.5 per cent less

in the first than in the last decade. Beitler believes that cancer mortality is increasing in the United States and that the question of more refined diagnosis and changes in the composition of the population are negligible factors.

CANFIELD, DOROTHY. See LITERATURE, ENGLISH AND AMERICAN, *Fiction*.

CAPE COD CANAL. See CANALS.

CAPE COLONY. See CAPE OF GOOD HOPE PROVINCE.

CAPE OF GOOD HOPE PROVINCE. One of the four original provinces of the Union of South Africa. Population according to the census of 1904, 2,409,804, of whom 579,741 were whites; census of 1911, 2,564,965, of whom 582,377 were whites. In 1911 Capetown, the capital, had, with suburbs, 161,579 (85,442 whites); Capetown municipality had 67,159 (29,863 whites). Kimberley and Beaconsfield, 44,433 (17,507 whites); Kimberley municipality, 29,525 (13,598); Beaconsfield municipality, 14,294 (3404); Kenilworth, 614. Port Elizabeth, 30,688; with suburbs, 37,063 (20,007 whites). East London, 20,867; with suburbs, 24,606 (14,899 whites). Grahamstown, 13,830; Paarl, 11,018; Simonstown, 4751; Vryburg, 2461; Mafeking, 2296. Of the total population, Europeans form about one-quarter and the colored races three-quarters; one-fifth of the population is urban. Christians numbered 1,437,688, most of whom were Protestants; Roman Catholics, 35,934; Mohammedans, 24,189; Jews, 16,744. Returned as of no religion were 1,077,998, of whom 1,047,233 were natives. Of the total population, 1,735,491 (859,716 males) were unable to read or write. For area, population, production, and trade, see SOUTH AFRICA, UNION OF.

CAPE VERDE ISLANDS. A group of Portuguese West African islands, having a total area of 1516 square miles. Population (1912), 143,929. Imports and exports (1913), 1,860,240 and 306,684 escudos respectively. The budget for 1913-14 balanced at 474,135 escudos. Capital, Praia.

CARBIDE. See CHEMISTRY, INDUSTRIAL.

CARDEN, SIR LIONEL EDWARD GRESLEY. British diplomat, died Oct. 15, 1915. He was born in 1851, and educated at Eton College. In 1877 he was appointed vice-consul at Havana, and from 1885-89 was British Commissioner on the Mexican Mixed Claims Commission, subsequently filling consular and diplomatic posts in Mexico, Cuba, and Central America. He was British minister to Mexico from 1905-13. In the spring of 1914 he was appointed minister to Brazil, but instead of proceeding to that country, at the request of Sir Edward Grey he returned to Mexico where a struggle for rival candidates for presidency had reduced the country to a state of anarchy. He was convinced that the best chance for a stable government and for the safe interests of the Mexican people, lay in the success of General Huerta. This conviction emphatically expressed created friction between him and the United States government, and he was eventually recalled to London. On his arrival, he was informed that his appointment to Brazil had been revoked.

CARINTHIA. See AUSTRIA-HUNGARY.

CARNEGIE FOUNDATION FOR THE ADVANCEMENT OF TEACHING. See UNIVERSITIES AND COLLEGES.

CARNEGIE GEOPHYSICAL LABORATORY. See GEOLOGY; and MINERALOGY.

CARNEGIE INSTITUTE OF TECHNOLOGY. An institution for technical education founded by Andrew Carnegie at Pittsburgh, in 1909. The total enrollment in all departments in the autumn of 1915 was 3432. The faculty numbered 211. The institution includes four separate schools, each with its own faculty, buildings, and student body. These are the School of Applied Science, the School of Applied Design, the School of Applied Industries, and the Margaret Morrison School for Women. There were no noteworthy changes in the membership of the faculty during the year. An additional \$1,000,000 for the Endowment Fund was received from Andrew Carnegie. The total endowment at the end of the fiscal year 1915 amounted to about \$9,000,000, and the income from 1914-15 to \$603,320. There were 350,000 volumes in the adjacent Carnegie Library.

CARNEGIE INSTITUTION OF WASHINGTON. The annual official report for 1915 differs from preceding reports on account of the European war. Instead of summaries of the important work done in the several departments of the institution, it deals mainly with the salient events of the year, the characteristics of the institution, its financial records, and its publications.

With the progress of the war it became increasingly clear that there must be a suspension of the institution's activities in the belligerent countries. Therefore all research associates of American citizenship were withdrawn from war zones. The result was many changes in plans, especially in the departments of historical research and terrestrial magnetism, and delay in research work because of exclusion of the workers from necessary sources of information. Except for this, however, the direct effects of the war upon the activities of the institution have not been serious. The unparalleled destruction of life and property now going on in Europe will probably have closely related though quite different results in neutral countries; and it is not inconceivable that sound methods of research may undergo a temporary eclipse as a consequence of the pending struggle.

The institute's participation in the Panama-Pacific International Exposition called for a very restricted choice of illustrations of methods and results of research, in order to make a successful appeal to a wide range of popular interests. Photographs, models, pamphlets explaining the plan and development of the institution, and a classified list of its publications, were freely distributed. The aim was to get an objective popular estimate of the institution's functions in contemporary society. The results showed (1) that inappropriate ancestral prepossessions still clouded popular views of scientific research, and (2) that there was a tendency, noticeable even in the public press, to exaggerate and to attribute to occultism the most manifest products of forethought, diligence, and the application of well-known principles. Nevertheless it was evident that the scientific method is gaining wider recognition even among unreflective minds, and this is seen in nearly every field of current activity. New research institutions have sprung up in the last few years, and these have been benefited by the influence of, and by their relation with, the Carnegie Institution. More rational notions of the meaning and objects of research, and especially of its cost

and the economies to be gained by it, are being disseminated. Along with the rise of new research organizations the scientific method is rapidly gaining control in the management of commercial and industrial enterprises. The necessity of science in successful business is thus aiding in the diffusion of sound learning among the masses. The so-called laborer now has to know more than he knew before; many manufacturing plants now provide instruction for operatives; and, what is more important, there is a general recognition of research as an essential preliminary to progress.

With regard to the costs of research, the Carnegie Institution has found it necessary to endeavor to correct popular misapprehensions. With this in view it lays down the following elementary truths, which have been generally ignored: (1) Sound research is expensive in proportion to its comprehensiveness and thoroughness; (2) the objects of research are now too great in number to be adequately financed; (3) each research organization must therefore choose its field and restrict itself to it. In this connection the relatively narrow limitations of the Carnegie Institution may be illustrated by the fact that the United States government spends, for work which may be properly called research, twenty times the income of the institution. Municipalities and industrial organizations are likewise active. No endowed institution can be reasonably expected to supplant governmental functions or to supplement governmental resources in research, and our understanding of this truth is necessary to correct fallacious popular beliefs that the Carnegie Institution should undertake enterprises for which it cannot be financially responsible. Its activities are strictly limited by its income, more especially since the purchasing capacity of monetary standards, which has fallen by more than 30 per cent during the last two decades, is apparently still diminishing.

The report for 1915 contains the first official statement yet made as to the theories of procedure in the institution and of the objects to be attained. This has been possible only after a decade of patient observation. While it is easier to say what the institution is not rather than what it is, nevertheless it may be positively defined as an establishment for the conduct and promotion of original research, whose results are freely given to the world without restrictions of letters-patent and without privileges derived from copyrights. In answer to innumerable inquiries as to what it can undertake, or as to the scope of its activity, the attitude of the institution may be said to be liberal in its recognition of all branches of demonstrable knowledge and critical in respect to all unverified and unverifiable representations. While no attempt has been made to limit recognition to mathematico-physical science, it needs to be said that complete equality in application of the institution's income has not been attained and is unattainable.

Its departments of research are the most striking characteristic of the institution, and absorb the bulk of its income. For their work long periods of time are required and the true value of the results cannot be estimated adequately in terms of an interval shorter than a decade. With respect to these departmental aims, needs, and attainable ideals the report

for 1915 omits the brief summaries hitherto annually given and is restricted to general observations. In doing so it protests against any narrow interpretation of the word "practical," affirms that, in general, results justify the cost, and that, as regards completion of the work of any department, it is unwise to expect from sudden discoveries results at all comparable to those obtained from steady increments of knowledge. These remarks hold true not only concerning the work of the departments, but of the activities of research associates.

A noteworthy feature of the institution is the Division of Publications established in 1909. The problem of book distribution is solved by sale at nominal prices, to cover the cost of book-making and transportation to purchasers.

In the fiscal year ending Oct. 31, 1915, the total appropriations amounted to \$1,274,017; the total receipts for the year were \$1,215,046. The total of appropriations in 1912-15 was \$11,228,577; the total receipts, \$11,656,532. During the year the following amounts were allotted: Botanical research, \$40,615; experimental evolution, \$48,919; geophysical laboratory, \$89,164; historical research, \$31,400; Marine biology, \$19,150; meridian astrometry, \$26,380; solar observatory, \$220,130; terrestrial magnetism, \$141,310; embryology, \$32,180; nutrition laboratory, \$45,064; Division of Publications, \$10,000.

The annual meeting of the Board of Trustees was held in December. Two distinguished research associates died during the year: Alfred Thayer Mahan, Rear Admiral, United States navy (retired); and Charles Sedgwick Minot, professor of comparative anatomy in the medical school of Harvard University. The president of the institution is Robert S. Woodward.

CARNEGIE MAGNETIC INSTITUTE.

See *EXPLORATION, Oceanic*.

CAROLINE ISLANDS. Formerly a German possession lying north of New Guinea and forming a dependency of German New Guinea (q.v.). Area (Caroline, Palau, and Mariana or Ladrone Islands, excepting Guam), 307 square miles; population, about 55,000; white population (1913), 264 (of whom 154 Germans). Capitals, Pohnaé and Yap. The principal export is copra. British troops took it in 1914.

CARR, LUCIEN. American archaeologist and art curator, died Jan. 27, 1915. He was born in Lincoln County, Mo., in 1829; graduated from St. Louis University in 1846; and from 1877 to 1894 was assistant curator at the Peabody Museum of American Archaeology and Ethnology. He wrote several books on archaeology, including: *The Mounds of the Mississippi Valley*; *Prehistoric Remains of Kentucky* (with Prof. N. S. Shaler); and *Missouri* (a brief history).

CARRANZA, VENUSTIANO. See *MEXICO, History*.

CARSON, SIR EDWARD. See *GREAT BRITAIN, History, passim*.

CASTELNAU, GENERAL DE CURIÈRES DE. See *FRANCE, History, Politics and High Command*.

CATHER, WILLA S. See *LITERATURE, ENGLISH and AMERICAN, Fiction*.

CATHOLIC UNIVERSITY OF AMERICA.

A Roman Catholic institution for higher education, founded at Washington, D. C., in 1887. The total enrollment in all departments in the autumn of 1915 was 680. The faculty numbered

85. The Very Rev. John A. Ryan, D.D., and Rev. John O'Grady were made members of the faculty during the year. No noteworthy benefactions were received in 1915. The productive funds of the university at the end of the fiscal year amounted to \$3,736,144. The library contains about 80,000 volumes.

CATSKILL AQUEDUCT. See *AQUEDUCT*.

CATTLE. See *DAIRYING*; *LEATHER*; *STOCK RAISING AND MEAT PRODUCTION*; *VETERINARY MEDICINE*.

CAVALRY. See *MILITARY PROGRESS*.

CAVELL, EDITH. See *BELGIUM, History, Case of Edith Cavell*; *GREAT BRITAIN, History*.

CAYENNE. See *FRENCH GUIANA*.

CELTIC PHILOLOGY. See *PHILOLOGY, MODERN*.

CEMENT. The most notable feature of the cement industry in 1914 was the fact that the first recorded decrease in the annual production of Portland cement took place in that year. This was due to the large increase in production and stock in 1913, which resulted in a necessary curtailment of the output in 1914. Natural cement showed an increase, but it was not sufficient to carry the total for all hydraulic cements beyond the record production of 1913. The price of Portland cement decreased 7.8 per cent a barrel in 1914. The total quantity of Portland, natural, and puzzolan cement marketed or shipped from the mills in 1914 was 87,257,552 barrels, valued at \$80,533,203, compared with 89,541,348 barrels valued at \$89,550,527 in 1913. The quantity of Portland cement marketed in 1914 was 86,437,956 barrels, valued at \$80,118,275. The total quantity of Portland cement produced in 1914 was 88,230,170 barrels, valued at \$81,789,368. Pennsylvania is the most important producer of Portland cement, with Indiana second, and New York third. In 1913 the output of California exceeded that of New York and Illinois, but in 1914 this State dropped from third to fifth place. Other States producing large quantities are Missouri, Michigan, Iowa, New Jersey, Kansas, Texas, and Washington. The exports of cement from the United States in 1914 amounted to 2,552,656 barrels, valued at \$3,760,920. The imports of foreign cement amounted to 120,196 barrels.

The production of natural cement in the United States in 1914 was 751,285 barrels, valued at \$351,370, compared with the output of 744,685 barrels, valued at \$345,880 in 1914. The chief producers of natural cement are New York, Pennsylvania, Illinois, Indiana, Ohio, Georgia, Minnesota, and Kansas. The output of puzzolan cement in 1914 was 68,311 barrels, valued at \$63,358. Practically the entire quantity was produced in Alabama, Ohio, and Pennsylvania.

See *CHEMISTRY, INDUSTRIAL, Cement from Beets*.

CENTRAL AMERICA. See *Central American countries*; and *PEABODY MUSEUM*.

CEPHAELINE. An alkaloid obtained from the ipecacuanha plant. Its chemical formula is $C_{14}H_{20}O_4N$, and it occurs in snow-white needles, which readily turn yellow. Its action and uses are the same as those of the plant from which it is derived, but it is more emetic than ipecac and causes more irritation of the kidneys; on the other hand it is less nauseant and less depressing to the heart.

CEYLON. An island in the Indian Ocean, south of India; a British crown colony. The

capital is Colombo. Area, 25,332 square miles; population, according to the census of March 10, 1911, 4,110,367. There were 8524 Europeans, 26,673 Burghers and Eurasians, 2,715,686 Singhalese, 1,060,167 Tamils, 267,054 Moors, 12,992 Malays, 19,271 various. More than half the people (2,474,393) are Buddhists; Hindus, 939,701; Christians, 410,525; Mohammedans, 284,482; various, 1266. The city of Colombo had 213,396 inhabitants; Negombo, 13,152; Moratuwa, 27,253; Kalutara, 13,006; Kandy, 30,148; Jaffna, 40,539; Galle, 40,187; Matara, 13,851; Batticaloa, 10,715; Trincomalee, 9086.

Plantation laborers number about 510,000 (in large part Indian coolies). Acreage under coconuts, 942,621; rice, 680,574; other grains, 101,708; tea, 580,845; rubber, 215,000; cinnamon, 47,292; cacao, 43,358; tobacco, 16,241; coffee, 1512; cinchona, 263. There are 1986 gem quarries, and pearl banks leased to an English company; the plumbago mines and pits (381) yielded (1913) about 570,807 cwts., valued (estimate) at Rs. 9,047,290.

Commercial and financial statistics appear below, in rupees (total trade and trade with the United Kingdom; total shipping and British shipping):

	1910	1912	1913
Imports	164,864,708	181,999,991	199,640,797
Imports, U. K. . . .	42,874,524	50,999,044	58,199,628
Exports	178,717,722	198,954,902	234,863,554
Exports, U. K. . . .	80,063,196	97,756,191	105,612,748
Revenue	43,741,758	50,156,329	52,476,416
Expenditure	36,467,708	49,277,870	55,494,754
Shipping*	15,038,445	15,420,142	15,811,078
Shipping Br. ...	9,755,605	10,114,485	12,313,392

* Tonnage entered and cleared.

A large part of the trade is with British colonies. Public debt, Dec. 31, 1913, Rs. 91,505,020. The railways are all owned and operated by the government; total mileage, 604½. The line from Madawachchi to Talai Manaar (about 65½ miles) at the northwestern end of Manaar Island, will be connected with the Indian railways by steamers landing at Dhanuskodi, the terminus of the Indian line. Governor (1915), Sir Robert Chalmers.

Tributary to the Ceylon government is the Maldivé Archipelago (a group of 17 islands, with a population estimated at 72,237); the Laccadive Islands belong to British India.

A serious rebellion in Ceylon was reported in September by German dispatches. The entire island was asserted to have been in revolt since June; rioting and sanguinary street-fighting had occurred at Colombo; thousands of persons had been killed and other thousands arrested. The English press was inclined to regard the disturbances in Ceylon as unimportant local outbreaks, devoid of political significance.

CHAMPLIN, JOHN DENISON. American author, and editor of reference books, died Jan. 8, 1915. He was born in Stonington, Conn., in 1834; graduated from Yale in 1856; studied law; and in 1859 was admitted to the bar. He practiced but a short time, however, becoming a newspaper editor. From 1869 until his death, practically all his time was devoted to writing and compiling. He was the author or editor of: *Young Folks' Cyclopædia of Common Things* (1879); *Young Folks' Cyclopædia of Persons and Places* (1880); *Young Folks' Cyclopædia of Natural History* (1905); *Cyclopædia of Painters*

and *Paintings* (1886-88); *Cyclopædia of Music and Musicians* (1888-90); *The Tragedy of Anne Hutchinson* (1911); and *One Hundred Families of the Seventeenth Century in England and New England* (1912). He was one of the editors of the *American Cyclopædia* and the *Standard Dictionary*; contributed, also, to the *Encyclopædia Britannica* and the *Memorial History of New York*; and wrote many articles for magazines and newspapers.

CHANDLER, JOHN GORHAM. American soldier, died June 21, 1915. He was born in 1830 at Lexington, Mass., and graduated from the United States Military Academy in 1853. At the outbreak of the Civil War he was captain and assistant quartermaster. He served throughout the war, and in 1867 was appointed major and quartermaster. After advancing to the rank of brigadier-general in 1904 he was retired. He received two brevets for gallant service during the Civil War.

CHARCOAL, ANIMAL. See CHEMISTRY, INDUSTRIAL, *Bone Black and Charcoal*.

CHARITIES. As in the immediately preceding years, so in 1915, there was a continued expansion of the scope, purpose, and financial resources of charitable and philanthropic undertakings in the United States, if not throughout the world. There were no large new foundations, but there were numerous benefactions (see GIFTS), and the total expenditures in all lines of charity and philanthropy were not less than a half billion dollars. The work undertaken by the Rockefeller Foundation (q.v.), the American Red Cross, and numerous other societies in 1914 for the relief of Belgium was continued and new undertakings for the relief of Poland, of Serbia, and of the Jewish population of devastated areas were begun on a large scale. (See RED CROSS, and RELIEF FOR WAR VICTIMS.) At the opening of the year American cities were struggling with a very acute problem of relief for unemployment; the development of business made this particular problem less difficult in the winter of 1915-16. (See UNEMPLOYMENT.) Matter of interest in connection with this topic will be found under the following articles: CHILD LABOR; JUVENILE COURTS; LABOR; MINIMUM WAGE; OCCUPATIONAL DISEASES; OLD-AGE PENSIONS; PENSIONS FOR MOTHERS; PENOLOGY; PROSTITUTION; WOMEN IN INDUSTRY; and WORKMEN'S COMPENSATION. These articles are of interest primarily through the fact that they show various organized movements for the prevention of destitution which is everywhere recognized now as immensely more rational than temporary relief, however necessary the latter may still be. Scientific inquiry into the causes of dependency and delinquency is necessarily followed by an extension of public supervision, the control of haphazard charitable activities, and constructive modifications of the industrial and social system so as to secure greater justice and self-sufficiency.

NATIONAL CONFERENCE OF CHARITIES AND CORRECTION. The 42nd annual meeting of this conference was held in Baltimore in May. With 2400 registered delegates, it was the largest meeting in the history of the conference. Indianapolis was chosen as the place for the 1916 meeting. Rev. Father Francis H. Gaviak of Indianapolis was elected president, and W. T. Cross was reelected secretary. The conference

changed its organization by reducing the number of ex-presidents on its executive committee from 22 to 3. This was believed to make the organization more democratic in that the control of the organization was placed in the hands of the members. There was presented a rounded community programme in children's work, which dealt with public, private, indoor, and outdoor work to secure fair treatment, health, and education for children. The family was discussed by Dr. Crothers and Prof. James H. Tufts of the University of Chicago. Dr. Tufts, analyzing and reviewing the old and the new in his paper on the "Ethical Basis of the Family," came to the conclusion that the family will remain about as it is without shifting toward free love and freer divorce than we have now. It will be wiser, he believed, to promote right marriages than to inveigh against divorce, and within a generation society will find some better method of dealing with illegitimacy than to inflict punishment upon the children for the sins of their fathers. He thought that, if we could improve morals, we should change social conditions by raising the standard of living, providing fairer wages and more recreation. Abraham Flexner argued against including social work among the professions, saying the professions have specific ends, while social work seemed to him not so much a definite field as an aspect of work in many fields, as medicine, law, education, and architecture. The need, he thought, is for well-informed, well-balanced, resourceful people rather than for any definite kinds of technical skill. Porter R. Lee took the opposite view, maintaining that case-workers and social investigators, who make up social workers, have developed technical skill to a point which may be considered professional. The one group is of social diagnosticians, while the other is of social investigators who provide the information on which sweeping changes through social legislation are based. Miss Vaile, supervisor of outdoor relief in Denver, gave a paper on public outdoor relief, emphasizing the success of turning such a public office into a charity organization, and the need for removing the old time relief official. Mr. Jeffrey R. Brackett of Boston pointed out that growth of the widows' pension movement tremendously increasing the cost of outdoor relief work makes it more necessary than ever that public funds be safeguarded from abuse. The public must take an intelligent interest in the care of the poor, for the protection of the public as well as for the protection of the poor, and it must gradually secure a better administration of relief, just such as it has of schools and fire departments. The relation of public to private charity was also discussed. A community plan in children's work was described by its author, C. C. Carstens, of the Massachusetts Society for the Prevention of Cruelty to Children.

The following committees for 1916 and their chairmen were named: Children, Julia C. Lathrop, Washington; corrections, Katharine B. Davis, New York; public and private charities, H. H. Shirer, Columbus; family and community, Ada E. Sheffield, Cambridge; feeble-mindedness, E. R. Johnstone, Vineland, N. J.; promotion of social programmes, Edward T. Devine, New York; health, Prof. Irving Fisher, New Haven; inebriety, Bailey B. Burritt, New York; and unemployment, Prof. Charles E. Merriam, Chicago.

OTHER BALTIMORE MEETINGS. In conjunction with the foregoing met The American Association of Officials of Charity and Correction. The programmes dealt with treatment of the insane and mentally defective; home relief; correctional programmes and administration of institutions. The annual conference of the National Probation Association considered the securing of effective adult probation laws in the many States now having none; extension of probation work in rural communities; development and application of standards in juvenile court work. The American Association of Societies for Organizing Charity gave special attention to a constructive programme on the basis of the case-work method. In the discussion on "Maintaining Standards in Times of Stress" it was revealed that progress had been made since the hard times of 1907 in the intelligent handling of depressions and that greater confidence on the part of the public was manifested. It was stated that correspondence had been conducted with 289 towns and cities on all conceivable points regarding organization and the adaptations of policy to new situations. Other Baltimore conferences included: the National Federation of Settlements; National Conference on the Education of Dependent, Backward, Truant and Delinquent Children; National Federation of Remedial Loan Associations (see LOAN SHARKS); National Probation Association; and National Association of Jewish Social Workers.

STATE CONFERENCES. The nation-wide interest in organized and scientific charitable activities is reflected in the numerous State conferences held annually in all parts of the Union. Only a few of these may be referred to here. The 7th California Conference of Charities and Corrections met in February. Unemployment and the municipalizing of charity work were the foremost topics. The name of the conference was changed to California Conference of Social Agencies. The 12th State Conference of Charities and Corrections of Virginia met in February. The unique feature was the share taken by the colored delegates, whites and negroes being present in about equal numbers. The 14th annual meeting of the New Jersey State Conference of Charities and Corrections was held in April. The growing conviction of the responsibilities of the State and municipalities rather than private organizations for philanthropic undertakings was made clear. Points emphasized were: the tendency toward a broadening of public relief; agents should be trained social workers; the close connection of education with social problems; and prevention is fundamentally more important than cure. "The outstanding features of the 6th New York City Conference of Charities and Correction were the discussions of health programmes, medical social service, and the relations of occupations and diseases; the radical change created by recent legislation in placing the New York City Department of Correction upon a semi-reformatory basis through the introduction of the indeterminate sentence and parole system for the penitentiary and the workhouse as well as for the New York City Reformatory for Misdemeanants; the discussion of a city plan for Greater New York; and unemployment as a social problem."* A resolution to form a State board of charities and corrections was an out-

* *The Survey*, June 12, 1915, p. 258.

come of the 3rd Alabama Sociological Congress held in May. Problems of legislation, of community health, and of improvements needed in rural conditions were also discussed.

"At its meeting in October, the Pennsylvania Conference of Charities and Correction was rechristened the Pennsylvania Conference on Social Welfare. The limited time of a two-day conference was so divided that half a dozen important subjects were treated in general meetings: prisons, infant mortality, mothers' assistance or pensions, juvenile courts and probation, public health, and charity organization work in small cities and in rural communities."* At luncheons were considered a large number of other topics, including: work for neglected and dependent children, public health nursing, community organization for social work, reformatory work for girls in small cities, federation for financial purposes, girls' clubs, hospital social service, social hygiene, social research, and special work for boys. The 41st annual convention of the Pennsylvania Association of Directors of the Poor and Charities and Correction was held in October. "The topics discussed included methods and principles of giving outdoor relief, qualifications and selection of employees for county institutions, prevention of feeble-mindedness, care of dependent children, the functions and administration of the almshouse, and the relations of county and State in the care of various classes of insane. The question of bringing about a union with the Pennsylvania Conference on Social Welfare was discussed, but no definite action was taken."* A resolution was presented to the Legislature by the Public Charities Association of Pennsylvania requiring the State board to devise and present to the next Legislature a plan whereby the State can assume full care and control of all dependent insane. The methods of financing and administering Pennsylvania charitable institutions have long been unsatisfactory to many students of such matters. The State is giving money to 300 institutions, most of them local in scope, private in management, sectarian and denominational in control. This fosters the development of unnecessary agencies, many of them inefficient, and has thrown the philanthropies into the game of unscrupulous partisan politics.

At the Massachusetts State Conference of Charities held in October fundamental plans rather than emergency relief methods for handling unemployment were discussed. Neighborhood recreation, mothers' aid, correctional institutions, and feeble-mindedness were also considered. The Illinois Conference of Charities and Correction celebrated its 20th anniversary at a meeting in October. Papers were read on "A Plea for the Under-average Child in the Public School," and "The Limit of Social Service Work by a Municipality." Mental and physical efficiency was discussed from the standpoints of public schools, the health commissioner, sociology, and business efficiency. Medico-social service, rural social service, the family and children, probation, and prevention of crime were considered.

CONFERENCES ON BLINDNESS AND TUBERCULOSIS. The first meeting of the National Committee for the Prevention of Blindness was held in New York in November. With an enlarged staff and an extended field it continues the work carried on for six years by the New York

Committee for the Prevention of Blindness. Illustrated lectures prepared in simple language for foreigners were suggested as an educational method. Compulsory notification of blindness at birth was emphasized as the most effective method yet at hand for reducing preventable blindness. Ophthalmia neonatorum, trachoma, toxic blindness, infectious and constitutional diseases, occupational disease and accidents were discussed as causes of blindness. It was urged that this committee remedy those conditions which spoil eye efficiency, such as poor illumination in schools, factories, stores, and elsewhere.

The National Anti-Tuberculosis Association met in four sectional conferences during October and November in different parts of the country. The Mississippi Valley Conference met at Indianapolis, the Southern at Columbia, S. C., the New England at Springfield, and the North Atlantic at Albany, jointly with the New York State Conference. The points especially emphasized at these four conferences were: standardization of methods; educational, nursing, dispensary, and institutional measures; the enlistment of the general medical practitioner in the movement; early diagnosis; tuberculosis as an industrial problem; the tuberculous negro with his racial and hereditary factors as well as environmental, housing, and work conditions; problems of childhood; open-air schools. Each conference appointed a continuation committee to arrange meetings and serve as a centre for appeals for legislative and general community support.

JEWISH CHARITIES. The National Association of Jewish Social Workers met at Baltimore in May. Consideration was given to general problems as well as to those peculiar to the charitable work among Hebrews on account of their dietary laws and special customs. The problem of tuberculosis and especially of transportation of afflicted persons was discussed. In connection with family desertion the activities of the National Desertion Bureau which had been previously organized were analyzed. The establishment of a school for Jewish social workers with courses in Jewish history, language, and literature was considered; favor was expressed for a national field secretary to organize Jewish communities, and \$1500 was pledged to this end. Other subjects considered were the naturalization of Jewish immigrants, the problems of the Jewish settlement, and especially its relation to other relief agencies.

In New York City the Jewish Community established a placement clearing house at 360 Second Avenue. Six departments were established to analyze the problems peculiar to Jewish people in industry, in philanthropy, in religious affairs, in education, in social work, and in social morals. The Free Synagogue undertook an interesting experiment in the relief of unemployment (see UNEMPLOYMENT). The Jewish Aid Society of Chicago similarly entered upon the plan of establishing men in business who had become dependent through sickness or insufficient earnings. Plans for the Federation of Jewish Charities and Philanthropies in New York City made substantial progress.

CHARITY. See CHARITIES.

CHARITY, CITY. See MUNICIPAL GOVERNMENT.

CHARITY AND CORRECTION, AMERICAN ASSOCIATION OF OFFICIALS OF. See CHARITIES.

* *The Survey*, Nov. 13, 1915, p. 171.

CHARTERS, MUNICIPAL. See **MUNICIPAL GOVERNMENT.**

CHAULMOOGRA OIL. See **LEPROSY.**

CHAUTAUQUA INSTITUTION. During 1915 the attendance was not equal to that of 1914, and this was attributed to the war. Nevertheless, the attendance was second to that of the record year, and the home reading course showed an increase of 5 per cent over 1914, owing to the fact that this was the year of American topics in that course. At the summer assembly and school in 1915 there were about 3500 students in 200 different classes, and with a teaching faculty of 85. The programme was for eight weeks. Since *The Chautauquan* was merged in *The Independent*, the latter periodical, which now supplies for Chautauqua readers a current events element, has been the official organ of the home reading circle. The Chautauqua Institution in 1915 started a monthly bulletin of helps and hints called *The Round Table*, which is sent to each of its members. The New York office is at 119 West 40th Street.

CHEESE. See **DAIRYING.**

CHEMICAL INDUSTRIES, NATIONAL EXPOSITION OF. See **CHEMISTRY, INDUSTRIAL**, section so entitled.

CHEMICAL INDUSTRY. See **CHEMISTRY, INDUSTRIAL.**

CHEMICAL SOCIETIES. See **CHEMISTRY, INDUSTRIAL.**

CHEMISTRY, GENERAL PROGRESS OF. It has been said that "Science moves but slowly, creeping on from point to point." This is not always true. The history of science presents its course rather as an irregular succession of rapid advances and slow ploddings. The discovery of a single phenomenon may suddenly open to view long vistas, the careful exploration of which will require many and laborious years. The phenomena of radio-activity, the characteristics of electrical discharges in vacuo, the X-ray spectra of metals and their reflection from crystal surfaces, the more careful study of spectrum lines and the influence of magnetic and electrical fields upon them, the very recent investigations on the behavior of substances at temperatures near the absolute zero or at pressures compared with which that at the bottom of the sea is insignificant, have furnished unexpected insight into the constitution of matter and placed theoretical chemistry upon an eminent vantage ground. The advances in 1915 have not fallen short of expectation. In a fragmentary account like the present only a few of the more salient investigations can be discussed.

Particularly persistent have been the researches on the so-called isotopic elements; that is, elements of identical chemical properties, which occupy the same space in the periodic table, but which have different atomic weights. The possibility of the existence of such elements was indicated by Mosley's work on the X-ray spectra, and in a radio-active disintegration series some of the elements have been shown to be isotopic. According to theory, isotopic elements are those which have the same positive charge on the nucleus of the atom, and it is this electrical charge, not the mass of the atom, that determines the chemical character of the element. During the past year a large number of determinations of atomic weight of the lead

contained in different radio-active minerals have been carried out. For lead from the mineral thorite Soddy and Hyman found the atomic weight 208.4. Honigschmidt and Morawitz found for lead from a crystallized specimen of uranite from Morogoro in German East Africa, the value 206.04. Others, working with lead from other radio-active sources, have found values between these two extremes. According to the latest determinations by Baxter and Thorvaldsen, the atomic weight of ordinary lead is 207.19. If we take into consideration that the end product of the radio-active disintegration of uranium is calculated to have an atomic weight of 206.0, and the end product of thorium an atomic weight of 208.4, we are led to the belief that ordinary lead is a mixture of at least two isotopic elements,—the end disintegration products of these two series.

How many of our chemical elements are mixtures of isotopes, we cannot say. Two forms of neon, with identical spectra, but having respectively the atomic weights 20 and 22, have been discovered by Aston working with J. J. Thomson.

In addition to lead, atomic weight determinations of the year 1915 include carbon, sulphur, iodine, copper, nickel, cadmium, mercury, tin, tantalum, praseodymium, ytterbium, and uranium. With respect to a sentiment favoring conservatism in the adoption of new atomic weights, no changes have appeared (until 1915) in the annual lists of the international committee on atomic weights since 1912. This year the following changes seemed warranted and have been made:

	Previously Accepted At. Wt.	At. Wt. According to International List of 1913
C	12.00	12.005
S	32.07	32.06
He	3.99	4.00
Su	119.0	118.7
Pb	207.10	207.20
Ra	226.4	226.0
U	238.5	238.2
Yt	89.0	88.7
Pr	140.6	140.9
Yb	172.0	173.5
Lu	174.0	175.0

In the field of high pressures Bridgman has continued his determination of melting point curves up to the very extreme pressures which he has been able to obtain, and has fixed the transition point curves of solids which exist in different forms over a range of 200 degrees Centigrade and up to 12,000 atmospheres (about 180,000 pounds per square inch). His work at these pressures, carried out by means of a chrom-vanadium steel bomb with a compressing piston fitted with a novel and practically un-leakable packing device, has broken a new trail into a far and fascinating field. All of the considerable number of melting point curves traced by him show a continuous rise or a continuous fall in melting temperature with the pressure. Judging from the results of his latest paper, the same rule usually holds for transformations of solid forms into other solid forms. But that this is not an absolutely general rule, is shown by the curve which gives the temperature of transformation of the red into the yellow form of mercuric iodide at different pressures. The temperature of transition at atmospheric pressure is 127°C; with increase in

pressure the transition temperature increases; at 5000 atmospheres it reaches a maximum of 181.2°C. Further increase in pressure causes a fall in the transition temperature, and at 10,000 atmospheres the equilibrium temperature is only 79.4°C. According to thermodynamics, at the maximum of the melting point or transition curve the specific gravity of the two forms should be the same, and this is experimentally found by Bridgman to be the case.

The determination of the compressibility of 38 elements in the solid state by Richards and his students has been completed. The earlier values were referred to that of mercury. Recent determinations of the compressibility of mercury, however, by Bridgman, E. P. Bartlett, J. H. Hodges, and Richards, have fixed the absolute value for the compressibility of this substance within narrow limits, and a recalculation of the compressibility of the other elements to this standard has accordingly been made.

A comparison of the compressibilities of the elements with their atomic weights brings out clearly that this quantity, like the atomic volumes, coefficients of expansion, reciprocals of absolute melting points, etc., is a periodic function of the atomic weights. Particularly striking is the close parallelism between the curves of atomic volumes and of compressibility. Tungsten has the smallest compressibility of all the elements studied.

Turning to investigations at very low pressures, the researches of Langmuir on chemical reactions in the presence of electrically heated filaments attract attention. It appears that when a wire of tungsten, platinum, or palladium is heated in an atmosphere of hydrogen under reduced pressure, part of the gas is dissociated into atoms. This atomic hydrogen has remarkable properties; it readily condenses on glass surfaces, reduces metallic oxides, and reacts with oxygen and phosphorus at room temperature. Langmuir has calculated that the percentage dissociation of hydrogen under a pressure of 760 millimeters of mercury is 0.33 per cent at 2000°K, and 30.0 per cent at 3500°K, and that the heat of formation of ordinary from atomic hydrogen is 76,000 calories per gram mol, that is, appreciably greater than the heat of combustion (67,500 calories), of the same quantity of molecular (ordinary) hydrogen.

Of the work published in 1915, that of F. Haber and his co-workers on the thermal and chemical behavior of ammonia stands out prominently as a thorough and accurate scientific study of a problem of high technical importance. The results of these researches which have occupied some four years, appear in a series of articles in the *Zeitschrift für Elektrochemie*. As is well known, the amount of ammonia produced in the reaction $N_2 + 3H_2 = 2NH_3$ from a given amount of hydrogen and nitrogen, if all three are allowed to remain in contact until equilibrium is reached, is dependent upon the pressure and the temperature (see article AMMONIA in the NEW INTERNATIONAL ENCYCLOPEDIA, 2nd Edition). Two of the papers in this series deal with the equilibrium constant characteristic of the reaction in question at 1 atmosphere and at 30 atmospheres from 580° to 1100°C. The method consisted briefly in allowing a mixture of hydrogen and nitrogen to pass under constant pres-

sure through an electrically heated quartz tube containing the osmium catalyzer. The temperature of the tube was kept constant. The volume of mixed gases passing into the reaction tube was measured by means of a gas meter. The gases passing out were allowed to flow through wash-bottles, which removed the ammonia, and then through a second gas meter, readings on which recorded the amount of nitrogen plus hydrogen remaining uncombined. Two other papers of the series deal with the heat of formation of ammonia at 0°C and from 466°C to 659°C. Still another paper discusses the efficiency of uranium nitride as a catalyzer and also the dependence of the amount of ammonia formed in the reaction on the rate of flow of the gases through the catalyzing chamber. It is shown that although the percentage of ammonia in gases which have passed over the heated contact substance decreases with increase in the velocity of flow, the total amount of ammonia formed increases with the velocity.

Ernst Cohen has continued his long series of researches on the allotropy of the metals. To summarize the results, he has found that most of the metallic elements exist in allotropic forms and that as ordinarily known the elements are really mixtures of different forms in metastable equilibrium, the proportions of these forms present in any given specimen of the element depending upon the immediate thermal history of the specimens. Methods have been found for preparing the different allotropic forms in pure condition, and some of their physical properties have been measured. The importance of these discoveries is evident. The heat of fusion, heat of reaction, and in general all the physical and chemical properties of an element will differ for the different allotropic modifications. The determinations of these quantities carried out by previous investigators were, not upon individuals, as supposed, but upon mixtures of indefinite composition. As a matter of fact, the values for the heat of fusion of sodium found in the literature show differences of 80 per cent and those for lead of 20 per cent. The most recent work by Cohen, and by Cohen and Heldermaun includes studies of the allotropic forms of lead, bismuth, zinc, antimony, potassium, and cadmium.

H. Kamerlingh Onnes, who succeeded in liquefying helium, has continued his work at low temperatures. His latest researches include determinations of the vapor pressure of hydrogen from the boiling point to the triple point, and of carbon dioxide from -160°C to -183°C, of the critical points of oxygen and nitrogen, and of the specific heat and thermal conductivity of mercury at temperatures obtainable with liquid helium. Most sensational are the extraordinary electrical conductivities of metals at temperatures in the neighborhood of the absolute zero. The conductivity of lead, for example, at 1.8° absolute, is 200,000,000 times as great as at ordinary temperature. With such a "superconductor" Onnes was able to imitate a permanent magnet. A closed coil of lead wire having a resistance of 736 ohms was placed in a cryostat containing liquid helium, and a current of 0.8 amperes was induced in the coil by withdrawing a magnet from its vicinity. After one hour the current flowing through the coil had not appreciably decreased.

The lead coil with its continuously encircling and but slowly decaying current has, of course, the properties of a magnet. With regard to the theoretical bearings of Onnes's experiments on "superconductors," it may be noted that they strike a death blow at the electron theory of electrical conduction. Neither the number of electrons in the conductor, nor their velocity can possibly be conceived to increase with lowering of temperature.

Radium preparations have been tried to such an extent in medicine that it is not surprising to learn that experiments on their effect on plant growth have been made. But the results are somewhat startling. Stoklasa and Zdobrisky treated various plants with water in which radium emanation had been dissolved. Lentils, peas, and wheat registered gains of 62, 116, and 164 per cent respectively over the control plants which had not been so treated. Rusby used radium ore tailings to enrich several acres of land. Of the 27 kinds of vegetables that were planted, only three failed to show a gain under enrichment with radium. The average increase was 30 per cent. Using a method which he has developed for determining the radio-active content in a fifty-pound sample of soil, Sanderson analyzed thirteen typical Minnesota soils for radium and thorium. Without exception the soils comparatively rich in radio-active content were fertile, and vice versa.

ORGANIC CHEMISTRY. When one views the ponderous volumes of Beilstein's great reference work on organic chemistry, one might almost think that that science would present a poor field for further research. But when one considers that, as Holeman calculated in 1915, of the 5000 possible benzol derivatives containing two and three common substituents only about 7 per cent have actually been prepared, it becomes evident that organic chemistry still offers alluring opportunities.

A doubting attitude toward the value of preparing new compounds and new classes of compounds, is almost as unreasonable to-day as it would have been a quarter of a century ago. Without knowledge of amino acids, nothing could have been accomplished toward protein analysis; sugars led to glucosides; purines to nucleic acids; butadienes to rubber synthesis—the list might be continued indefinitely.

For several years organic chemistry has more and more concerned itself with substances of biological origin. Emil Fischer's researches on sugars, purines, proteins, polypeptides, peptides, and glucosides, which comprehend volumes, are all of great importance biologically. Wallaech has devoted much of his time to the terpenes—another class of biochemical substances. Wilstätter, Piloty, Hans Fischer, and others are steadily progressing toward knowledge of the structure of chlorophyll and hæmoglobin. Cellulose, starch, cholesterol, and the still unexplained alkaloids show signs of yielding to the efforts of skilled workers.

During the year, in addition to his chlorophyll contributions, Wilstätter investigated the red, blue, and violet coloring matter of flowers and fruits. These substances, known as anthocyanins, are usually present in small quantities, although the dry petals from the dark-red dahlia may contain as much as 20 per cent of pigment. The anthocyanins are glucosides or

galactosides having one or two six-carbon sugar molecules combined with the pigment proper. They contain no nitrogen, but are basic in properties. In their preparation a large quantity of dry petal meal was extracted with glacial acetic acid or acidified alcohol and an impure anthocyan oil precipitated with ether. Recrystallization of the picrates gave nicely crystalline pure products. The anthocyanins have been named, from their sources: pelargonin, cyanin, delphinin, pæonin, and so forth. Hydrolysis of these anthocyanins with strong hydrochloric acid gives the sugar and the chlorides of the anthocyanidin pigments of pelargonidin, cyanidin, delphinidin, or pæonidin. Of these, cyanidin and pelargonidin have been synthesized by Wilstätter, and the structure of nearly all has been determined. They all contain trihydroxy-benzol, and a mono-, di-, or trihydroxy-benzoic acid or its methoxyl derivative. Anthocyanins occur in nature in various colors. The acid salts are red, the alkali salts blue, while the neutral bases are violet. The blue corn flower contains the potassium salt of cyanin. Anthocyan solutions are decolorized by isomerization in neutral solution, but the color is restored by addition of acid. Wilstätter has suggested that vari-colored petals are so, not because of heterogeneous distribution of oxidases, but because of differential hydrogen ion concentration.

Osborne and Mendel's *feeding experiments* with isolated proteins have now yielded sufficient data to justify some discussion of their biochemical aspects. All previous experiments of this nature had been limited to more or less empirical food mixtures. Now, however, that chemistry is in possession of a number of comparatively pure vegetable proteins and of a knowledge of their hydrolysis products, a really scientific study of nutrition has become possible. Albino rats were chosen for the experiments in question for several reasons: their food requirements are small, and they are easily cared for; their growth rate has been exhaustively investigated by the Wistar Institute, and the life period was found to be only about three years, so that a short period is comparable with several years in man. It has for years been recognized that gelatin lacks one or more constituents necessary to the maintenance of life. Osborne and Mendel have found that zein from corn, hordein from barley, and possibly other proteins are inadequate to sustain life, although fully digested. But the addition of the amino-acids, known as tryptophane and lysine, renders the above proteins fully adequate to sustain life and promote normal growth. Some few amino-acids are apparently incapable of synthesis by the body; but disproportionate amounts of the various amino-acids in the ingested protein, or even the absence of some of them does not seem to affect nutrition. Rats have been bred through three or four generations upon a diet containing glycocholate-free casein as the sole protein. A female rat fed on sugar, starch, fat, and a mixture of inorganic salts simulating bone-ash, produced a litter of three young and nourished them to normal growth rate. These facts suggest some startling questions. It seems extremely improbable that these peculiarly fed rats differed from normally fed ones in body composition. But then, are we to con-

clude that from a protein of such peculiar constitution as gliadin, from carbohydrates, and a mixture of inorganic salts, the female has synthesized her own complex body constituents and also secreted a perfectly normal milk? Fats, too, are not essential, as rats were grown at normal rates on food completely free from fat.

The question whether growth may be deferred until old age was also taken up with very interesting results. Since gliadin is incapable of promoting growth, although furnishing body maintenance, young rats were kept on such food until long after the period at which normal growth would have ceased. But when now a mixed diet was introduced, the animals grew to adult size at a normal rate. Is there stored in each animal a substance capable of promoting growth under proper nutritive conditions, but remaining quiescent and itself unchanged as long as the nutritive conditions are abnormal?

Among items of interest is the isolation, by Scherndal, of "azulene," the blue hydrocarbon occurring in very small quantity in terpene oils. Scherndal ascribes to it the formula $C_{10}H_8$, and believes it to be highly unsaturated. The substance was isolated by its solubility in concentrated H_2SO_4 .

Fischer, having already prepared theophylline-glucoside and methyl-glucoside, has gone a step further in the synthesis of nucleic acids by combining the above glucosides with phosphoric acid. At the present stage, the purine-glucoside-phosphoric acids appear to bear to nucleic acids somewhat the same relation as polypeptides bear to the proteins.

Although negative in result, the attempt of Padoa to dissolve graphite from various sources in decaacylene is interesting. The general rule that "like dissolves like," coupled with the hypothesis that graphite is made up of cyclic carbon molecules, pointed to the desirability of such an experiment.

Japan lac has been shown by Majima to consist in large part of 1-pentadecyl 2,3 dihydroxy-benzol. The substances urushiol and hydro-urushiol were isolated and shown to give palmitic acid on oxidation. By a very nice synthesis, using 2,3 dimethoxy-phenyl-propionic acid chloride and the sodium salt of decylacetylene and subsequent reduction, Majima obtained a substance identical with the methyl ether of hydro-urushiol. Hydro-urushiol is of interest inasmuch as naturally occurring analogs lead one to suppose that the substance would be 1-pentadecyl 3,4 dihydroxy-benzol, but the synthesis of this compound eliminated this hypothesis.

An organic review would be incomplete without mention of Abderhalden. Toward the close of the year he published his synthesis of optically active fats. Naturally glycerides are known which exhibit optical activity, but these are composed of optically active acids and inactive glycerol. In this new class of substances the middle glycerol carbon atom is asymmetric. These new fats are prepared from 1- or d-epihydrin alcohol or active amino-glycerol and exhibit rotations of .5-2.6. No optically active fats occur in nature, and it seems probable that no enzyme exists which might resolve racemic fat mixtures (if such exist) into their components.

CHEMISTRY, INDUSTRIAL. (See also

CHEMISTRY, GENERAL PROGRESS OF.) The great war in Europe had a potent influence on industrial chemistry. The sending of men engaged on researches either in laboratories or universities to the front of course prevented the usual amount of chemical investigations. Curiously enough also the impossibility of sending finished products from Germany and others of the Central Powers to the usual markets compelled the undertaking of measures to produce articles never before made outside of Germany in order to fill the demand for current work. This was conspicuously the case in the United States, where extraordinary efforts were made, notably in the case of dyestuffs, aided by the efforts of the Bureau of Foreign and Domestic Commerce, to bring about the manufacture of materials in America to replace those that formerly came from Europe.

ORGANIZATIONS. The Ninth International Congress of Applied Chemistry was to have been held in Petrograd, Russia, during Aug. 1-14, 1915, under the presidency of P. I. Walden, but was postponed owing to the war in Europe. The previous congress was held in Washington, D. C., during Sept. 4-13, 1912. The American Chemical Society held its spring meeting in New Orleans, La., during April 1-3, 1915, and its summer meeting in Seattle, Wash., during Aug. 31-Sept. 3, 1915. The total membership had reached the large number of 7400. The president during the year was Charles H. Herty of the University of North Carolina.

The Society of Chemical Industry held its thirty-fourth annual meeting in the Municipal School of Technology in Manchester, England, during July 14-18, 1915, under the presidency of Prof. George G. Henderson. The membership was reported as 4017, as compared with 4142 last year. The formation of local sections in Edinburgh and the east of Scotland was announced. Dr. Charles C. Carpenter, of the South Metropolitan Gas Co., London, was chosen president, and for the next meeting Edinburgh, Scotland, was selected.

NATIONAL EXPOSITION OF CHEMICAL INDUSTRIES. During the week of Sept. 20-25, 1915, there was held in the New Grand Central Palace in New York City a National Exposition of Chemical Industries at which exhibits and demonstrations of products, processes, machinery, and apparatus applied in the chemical industries were made by leading manufacturers from all over the United States. The most important of these were those that demonstrated the efforts made by chemists to free the United States from foreign domination in the matter of chemicals and coal tar colors. It was in consequence of this fact, therefore, that the various bases used in making explosives as well as dyestuffs, including the anilines made by processes of Thomas A. Edison, attracted conspicuous attention. A study of the full line of exhibits demonstrated that resources existing in the United States, unheard of until the war began, have been used in the campaign for industrial independence, and the daily output of both chemicals and colors was steadily increasing. Motion pictures and lectures by chemical experts added to the value of the exhibits. A similar exhibition was projected for the year 1916 under the direction of a committee including among its members many of the leading chemists of the United States.

RELATIONS OF CHEMISTRY TO GOVERNMENTS. The members of both the Society of Chemical Industry and the Chemical Society of London, through their respective councils, proffered their services to the British government, and in consequence their membership was classified so that it was possible to furnish at a short notice a reliable and complete statement as to the sources of supply of particular chemical products, also to keep the government informed from the manufacturer's point of view of difficulties arising from time to time as respects labor, materials, transport, etc., which may be interfering with the output of essential chemical products.

Also an Advisory Council of scientific men was organized in Great Britain whose duties were to report to a committee of the Privy Council on (1) proposals for instituting specific researches; (2) proposals for establishing or developing special institutions or departments of existing institutions for the scientific study of problems affecting particular industries and trades; and (3) the establishment and award of research studentships and fellowships.

A Navy Invention Board was created in England, the duties of which are to coördinate and encourage scientific work in relation to requirements of the navy. Among the chemists appointed to the board are Herbert B. Baker, George T. Beilby, Percy F. Frankland, William J. Pope, and Sir William Crookes.

The French government, by a presidential decree, has created a special bureau in the Department of Commerce, for the duration of the war, charged with matters touching the production and supply in France of chemical and pharmaceutical products. The duties of this bureau are to determine the amount of existing stocks of chemical and pharmaceutical products, to estimate the present volume of production, and to secure production and distribution for the future.

In the United States the Secretary of the Navy announced the appointment on September 12th of a Naval Advisory Board of Inventions, consisting of 23 members with Thomas A. Edison as chairman. The representatives selected from the American Chemical Society are William R. Whitney of Schenectady, N. Y., and Leo H. Baekeland of Yonkers, N. Y.

MEDALS. On January 22nd the W. H. Perkin medal was awarded to Edward Weston for his work in connection with the development of the industries connected with the electro-deposition of metals, the electrolytic refining of copper, the construction of electric generators and motors, the electric illumination by arc and by incandescent light, and the manufacture of electrical measuring instruments. The Willard Gibbs medal of the Chicago Section of the American Chemical Society was, on April 17th, presented to Arthur Amos Noyes of the Massachusetts Institute of Technology for his investigations in industrial chemistry.

METALS. Aluminum. One of the results of the war in Europe was the transfer to American interests of the large aluminum plant in Stanley Co., N. C., by the foreign owners. There was a growing importance in the American production of this metal as shown by the value of its exports, which were \$1,101,920 for the year ending June 30, 1914, and a year later had increased to \$3,245,799. *Tungsten*, now so

largely used in the manufacture of high speed and other special steels, as well as in steel used for armament, was formerly obtained solely from Germany, but in order to meet the demand in England, a plant was established in Lancashire during the year. *Thorium and Mesothorium.* The salts of these rare metals are derived from the mineral monazite which is imported from Brazil, but the increasing use of thorium nitrate for incandescent gas mantles has agitated the possible utilization of the domestic supply. Monazite is found in North and South Carolina, Idaho, and on the Pacific Slope.

Radium. The demand for this valuable substance is also increasing. The Bureau of Mines reported a new and cheaper process for producing radium that differs from former methods not only in detail but in apparatus used. The time of operation is much shorter than in any other plant now producing radium, and the commercial recovery is much greater. Moreover, the cost of production is less. The market price of radium has been from \$120,000 to \$160,000 a gram, but the Bureau of Mines, with the plant under its supervision, is now able to produce it for \$37,000 a gram. The application of radium in the treatment of cancer and other malignant growths had made rapid progress during the years 1914 and 1915. Hospitals that have worked with as much as half a gram of radium reported cures in larger numbers. The extent and variety of cures reported and the helpful effects of the gamma rays at depth are almost in direct proportion to the quantity of radium that can be applied at one time to the patient. *Uranium and Vanadium.* In connection with radium there is reported a growing demand for the salts of these metals. The production of their compounds was greater during the year than ever before in this country. (See *The Rare Earth Industry* by S. J. Johnston, London, 1915.)

IRON AND STEEL. In October the Ford Motor Company of Detroit, Mich., announced that they had succeeded in making gray iron and malleable iron direct from the initial heat of the blast furnace. The elements while still in a molten state are changed, and refined, and finally finished, and poured direct into molds for gray iron or malleable castings, as the case may be. This new process not only effects a great economy in the cost of manufacturing, but also produces gray and malleable iron of much greater strength and durability. In January word came from Sheffield, England, that Thomas Firth and Sons had produced a stainless steel, which is nonrusting, unstainable, and untarnishable. This steel is especially adapted for table cutlery, as the original polish is maintained after use, even when brought in contact with the most acid foods, and it only requires ordinary washing to cleanse. It is said that it retains a keen edge like that of the best double-shear steel, and, as the properties are inherent in the steel and are not due to any treatment, knives can readily be sharpened on a "steel" or by using the ordinary cleaning machine or knifeboard. Later the same results were claimed by the Krupp Plant in Essen, Germany, by the announcement that they had developed a process for making steel that was absolutely immune against rust and even against the action of nitric acid.

POTASSIUM SALTS. With the cessation of the customary importation of potash salts from Germany and the danger of the interruption being continued indefinitely, there was a renewed interest in the possibility of securing a supply of these much needed compounds from domestic sources. Attention has been called in previous volumes of this YEAR BOOK to the work of the Department of Agriculture in searching the United States for sources of potassium salts to be used in the manufacture of fertilizers in place of those imported. Several sources were developed during the year. The first of these was the kelp which occurs in such vast quantities on the Pacific Coast where three varieties of seaweeds and rockweeds are found that contain large amounts of potassium salts. It was claimed that in the shallow waters of the Pacific Coast there was produced each year without cultivation a crop which, if simply collected and dried, possesses, as a fertilizer, at the market prices of potash and nitrogen before the war, a value of \$150,000,000. If used as a source of commercial potassium chloride, the product would have a value of \$90,000,000. The total cost of production was estimated at \$3.83 a ton, distributed as follows: cutting and collecting, \$1.83; drying, grinding, hauling, loading, etc., \$1; and general expenses, interest, etc., \$1. The total value of the ton based upon potash (\$9.07), nitrogen (\$5.93), and phosphoric acid (\$0.75) is \$15.75. Thus the margin for the refining of the crude material is nearly \$12 a ton, which, with the potassium chloride selling as high as \$2.05 a ton, seemed to offer a possible profit. In March a sale of 10,000 tons was reported in New York from this source at a price similar to that paid for the imported article. During the year ending June 30, 1914, 1,060,000 long tons of potash salts were imported from Germany for fertilizers which sold at about \$38 a ton. In October it was reported from the United States Geological Survey that a deposit of alunite in Utah was being worked, with the result that 200 tons of the mineral had been milled, yielding two tons of a product containing 99 per cent of potash. It was claimed that from this source alone adequate supplies of potassium salts for agricultural purposes could be obtained without any further importation from abroad.

An economical method of decomposing feldspar, of which there are large deposits in the United States, resulting in the salvage of potassium carbonate and of aluminum, was announced during the year. From the potassium carbonate thus recovered almost any of the salts of potassium could be obtained. The process consists of heating the feldspar with limestone and iron oxide at a temperature of about 2200 degrees F., which produces a partly fused mass that is easily decomposed by a weak acid. From this product the potash salts can readily be extracted for further purification. A practical tryout for another method of obtaining potash fertilizer was announced at a New Orleans distillery where molasses was used in large quantities. It is a fact that 106 tons of potash are wasted daily by the 25 or more distilleries where molasses is subjected to process of fermentation. The sugar beet waste in the United States, it is said, could be made to yield enough potash to supply the entire present de-

mand of the chemical manufacturers. About a third as much is lost annually in scouring the country's raw wool clip, and much of this could be recovered. Still another source is the salt incrustated valley floor commonly known as Searles Lake, in southeastern California, where a deposit of 4,000,000 tons of water soluble potash salts is available.

Other sources mentioned include the seaweed from the Sargasso Sea in the central Atlantic Ocean which, however, does not yield as much potash or nitrogen as the Pacific kelp. The ash of seaweed collected on the shores of Manila Bay gave 15 per cent of potash, an unusually large amount. Deposits of potassium salts in Spain are also known, notably from the province of Cataluña, but their commercial development has never been successful. The production of potassium salts in the United States from the different sources mentioned is chemically feasible in each instance, but the high cost of railroad transportation is the factor that has thus far prevented their commercial success.

SYNTHETIC AMMONIA. The *London Journal of Gas Lighting* published a process which allows of gas producers being utilized to manufacture ammonia by synthesis that has been devised by Adolph Bambach. By its aid atmospheric nitrogen can be fixed in the form of metallic compounds, both carbureted and nitrogenous (cyanides, cyanamides, etc.), or metallic nitrogen compounds (nitrides), and these substances decomposed, either with saturated and superheated steam or with water, to extract the ammonia.

NEW METHOD OF MAKING SULPHURIC ACID. The new feature of the method was that the gases employed are drawn downward through a spiral flue in place of being drawn through lead chambers or intermediate towers. It was asserted that the resistance of gases to the downward pull and the constant change in their course through the spiral tend to mix them very intimately. The fact that the gases constantly impinge on the walls of the spiral flue, which can be cooled either by air or water, makes it practicable to maintain the gases at a temperature most favorable for the efficient yield of sulphuric acid. In laboratory tests in which the spiral was used practically all the sulphur dioxide was oxidized to sulphuric acid, only traces being lost through escape or in the system. The lead spiral, however, was not intended to replace the Glover tower, nor to do away with the Gay-Lussac tower. It was believed that while the lead spiral would take considerable lead, the great reduction it would effect in the chamber space would make it possible to construct a plant with considerably less lead than is required in the ordinary chamber system.

BONE BLACK AND CHARCOAL. Waste bone black formerly discarded by refiners of sugar, petroleum, and glucose, and by other decolorizing institutions was the subject of serious study in Germany. The method of refining largely determined what disposition would be made of the waste material, and in large sugar refineries filtration processes are essential. If the waste bone black is used as an absorbent during the filtration it cannot be sold for other industrial purposes without being revived and again purified. Recently filter presses were so

improved that they largely could be used instead of bone black. Various German patents treat of processes to purify bone black after it has been used as an absorbent. One of these patents covered a process to purify bone black, using a gaseous sulphurous acid instead of diluted hydrochloric acid.

German chemists were making progress in the use of animal charcoal for medical purposes. It was discovered by experiments on animals that different kinds of poisonous substances, such as morphine, strychnine, and carbolic acid, lose partly or entirely their effect when given with animal charcoal. Not only can directly administered poisons be neutralized in their effect upon the organism by animal charcoal, but also poisonous substances which arise in the intestinal canal, as in the case of cholera. The action of animal charcoal extends to the bacteria themselves, which it mechanically absorbs, destroying their destructive influence. The labors of Freundlich, Lichtwitz, Glassner, and Suida show that the absorbing quality of animal charcoal is promoted by the presence of the phosphates, sulphates, and nitrates of calcium, sodium, and potassium. The rapidity of the absorption increases with the temperature, so that the heat of the animal body aids the therapeutic effect of the animal charcoal.

UTILIZATION OF PEAT. Late in the year a new process for the distillation of peat was patented in Great Britain and other countries by which coke, fuel oil, tuluol, ammonia, paraffin wax, and acetone are obtained in valuable quantities. The process is in practical operation and promises to revolutionize the peat industry and to furnish sources of fuel oil to the British navy which may make it independent of foreign oils. Peat, as taken from the peat beds, contains from 80 to 90 per cent of water and is of a fibrous cellular structure, so that by hydraulic pressure it is possible to lower the water content only slightly. An important part of the new process is a macerator that breaks up the fibrous cellular tissue and thus allows a more complete separation of the water. After passing through the macerator the broken peat is compressed into briquets, which are dried until they contain not more than 25 per cent of moisture, and then fed into a hopper from which they pass into the retort.

Irish agriculturists were greatly interested in the discovery by W. B. Bottomley of a method of converting ordinary peat into a highly concentrated fertilizer by a simple and inexpensive bacterial treatment. Professor Bottomley's principle is that bacteria facilitate the chemical processes connected with plant growth, and the peat bacterial culture immensely facilitates food absorption by vegetables and other farm crops. He has exhibited specimens of mature potatoes grown in seven weeks by the use of the peat fertilizer, and says that an acre of land treated with one ton of the peat manure has produced 41 per cent more potatoes than an acre treated with 80 tons of ordinary farm manure.

The Swedish experts commissioned to examine Laval's method of carbonizing peat reported the processes employed were as follows: The peat is diluted with a large quantity of water, the resulting pap is then heated to a temperature of 150° to 250°C. The chemical changes

thus produced leave a dry mass of an increased heat value, though reduced in volume, the physical constitution of the material being altered in such a way that water can be removed in a much larger proportion than would have been possible with the original peat. After the water has been partially removed by pressure or suction a product is left containing 50 to 70 per cent of water. By artificial drying peat powder is then easily prepared, to be used in the manufacture of briquets.

According to a Friesland newspaper, the municipal gas works at Akkrum, Holland, was extracting gas from peat mixed with coal. It was stated that if peat alone were used, the retorts would become too hot, because of the steam created by the moisture always found in peat. Accordingly the retorts are filled with two parts in weight of coal to one part of peat. The peat—as well as the coal—produces about 30 cubic meters of gas per 100 kilos (220.46 pounds). The gas produced from this mixture was declared to be of excellent quality. The peat is entirely consumed in the process, and therefore yields no by-products, as coal does in tar and coke.

CEMENT FROM BEETS. Excellent cement was being made in France from a by-product in the process of making beet sugar. The scum that forms when beets are boiled, and which has been thrown away, consists largely of calcium carbonate and water; and from 70,000 tons of beets treated, 4000 tons of calcium carbonate is obtained; to this 1100 tons of clay is added, the resulting product being 3162 tons of excellent cement. The scum is pumped into large tanks, where it is allowed to dry partially; finely divided clay is then mixed with it; the mixture is thoroughly amalgamated by beaters for an hour and burned in a rotary kiln, in the same way as Portland cement. The clinker is then removed and pulverized into cement.

CARBIDE SLIME AS BUILDING MATERIAL. In the manufacture of acetylene gas (from calcium carbide and water), considerable quantities of so-called carbide slime are left in the apparatus. In view of the large increase in the consumption of acetylene since the outbreak of the war, a report of R. Schumann on the utilization of carbide slime was of interest. The material could not be used as fertilizer, phosphorous salts being absent, but might be used as water purifier when of a certain composition. Experiments with the employment of carbide slime as building material yielded the best results. When mixed with 40 per cent of building sand, the carbide slime formed a usable mortar which set well and bound the bricks firmly. This new building material was to be thoroughly tested by further experiments.

A NEW ALLOY. The United States government was experimenting in the Brooklyn Navy Yard with a new alloy of aluminum and copper invented by L. C. Smith, intended for use in army and navy projectiles. It had the appearance of gold and was said to have the wearing qualities of Egyptian bronze that was manufactured some 6000 years ago, but which has never been reproduced since. There were about 10 alloys of aluminum and copper on the market which had been used as substitutes for copper and bronze. The chief difficulty in getting a composition of durability is to get the aluminum and copper to fuse. Tests were

also being made on battleships, where the alloy is being made to make fittings water tight. Other experiments are being made at the United States mint in Philadelphia with a view of substituting the alloy for the copper in one-cent pieces.

EXPLOSIVES. From Sweden a new explosive was announced that was very powerful, and one of the principal ingredients is ammonium perchloride prepared in a special way. "Kausolit," as it was called, has great explosive power and seems especially adapted for shells. An important discovery was reported by the Du Pont Powder Company whereby the time required to manufacture smokeless powder was greatly reduced. Under a new method adopted, the drying process took only 5 days instead of 60 days as heretofore. Only 21 days were required to turn out the finished product.

PAPER MAKING. Among the various materials advocated during the year as sources for making paper was the long leaf pine in the United States, while from Mexico came reports of excellent results from the use of henequen stalks and waste. Wrapping paper and strawboard were made in Venezuela from an aquatic plant that grows in large quantities on the margins of Lake Tacangua. A commercial paper pulp was made from the fibres of the Neuquen and Misiones pines in Argentina, and it was said that the fibres from these two varieties of pine trees when heated with bisulphite yielded a pulp surpassing in whiteness that of paper materials imported from Europe. From the searches made for raw materials to supply the demand for paper in Great Britain reports were received from the Union of South Africa, suggesting the use of papyrus and the tambookie grass, while from India the use of *Hedychium coronarium* was recommended. Experiments in Brunswick, Germany, showed that willow tree bark and broom fibres failed to yield satisfactory results, but from the fibre of hop vines an especially long fibre was available from which paper could be made.

A curious experience growing out of the war has been the shortage of filter paper used in analytical and technical chemistry owing to the inability of obtaining stocks of this material from Germany. To meet this condition the firm of W. and R. Balston of Maidstone, England, makers of the Whatman drawing paper, began to produce for the first time in England a filter paper that would compete with the German article. Reports showed that their paper had been used with universal approval. In the United States the problem came before the Bureau of Standards and was being studied by the experts of that bureau from the point of view that the present time was opportune for starting this new branch of an important industry.

SOAP FROM SUGAR. The discovery is announced from Hamburg of a method of manufacture of soap from sugar, of which Germany has plenty, instead of from oil, which is scarce. In the past it had been possible to use sugar only in soaps that had little value. By the new method, it is claimed, the soap produced is not only fine and delicate, but it acts as efficiently in salt water as in fresh, a fact that may make the soap valuable for the navy.

NEW METHOD OF EXTRACTING LEMON OIL. A new chemical process invented by Professor Li-

otta of Catania, Italy, may revolutionize the lemon oil industry. All previous chemical processes caused changes in the properties and smell of the essence, but the new method does not affect the oil in any way. The new process is as follows: The lemons are mashed in a large receptacle, and an acid, the nature of which is secret, is added. This acid causes the essential oil to separate and rise to the surface, from which it is drawn off. A chemical reagent is then added to the acid mixture that liberates the acid and permits its recovery. The residue, consisting of lemon juice, pulp, and peel, and foreign matter, is then sold to citrate manufacturers. The new process, it was claimed, would save about 2½ per cent more oil than the old hand process. The cost of extraction is 2.3 cents for 1000 lemons, and the process requires 22 minutes.

RUBBER. The advent of the war led to new uses, as there was rubber so treated as to make vessels unsinkable; there was the buffer of rubber that, when collisions occur at sea, gives only a slight tap; there was the sheathing of rubber for battleships, from which the enemy's shot and shell will rebound; and there were the rubber-studded blocks for fixing steel rails in chairs.

Successful attempts were made to manufacture a substitute for rubber tubing out of masses of solidified glue. These tubes, whose trade name is "Sonjatin," are better than those of rubber for certain purposes, since they are more impervious to gases and more resistant to heat. It was also claimed that they do not grow rotten so quickly as rubber and that when encased in a suitable envelope they will withstand high pressure. The inventor, J. Traube, stated that they were also peculiarly suited for conductors of petroleum and gasoline.

A valuable discovery, it was claimed, had been made in Ceylon in the use of coconut water as a rubber coagulant. This method, if as successful as experiments would indicate, should prove a great boon to the rubber industry. Millions of gallons of coconut water, which now runs to waste on estates in copra drying and desiccation mills, can be utilized as a profitable by-product, besides producing a superior coagulant in making rubber.

NEW PROCESSES FOR COAL AND PETROLEUM PRODUCTS. There had been in recent years a growing demand for gasoline owing to its increasing use for motor vehicles. Also for many years the United States had imported from Germany the special products of the distillation of coal, such as benzol and toluol, used in the manufacture of coal tar dyestuffs. In March the Bureau of Mines announced that Dr. Walter F. Rittman, a member of its staff, who had been working in the chemical laboratories of Columbia University, had found that by treating vapor of petroleum instead of the liquid itself he could get greater pressure than by use of the still. In the still, pressures of 100 pounds are high, and an undue increase of heat after that pressure is reached is usually dangerous. Gas, however, is compressible to a much greater degree than 100 pounds without danger of explosion in apparatus of the type used, and, in his experiments, Rittman has succeeded in working with a pressure greater than 500 pounds. With such pressures and with a degree of heat perfectly controllable by the

means used, the Rittman process not only delivers gasoline to the amount of from 50 to 75 per cent, but permits him to obtain benzol and tuluol at will. By this invention, it was claimed, 200 per cent more gasoline could be obtained from a given quantity of petroleum than had been possible in the past. Rittman's process was patented "for the general use of the public."

A still further application of the "cracking" principle was the discovery by Dr. Walter O. Snelling of the conversion of natural hydrocarbons of all kinds, such as vaseline, red wax, fuel oil, etc., into "crude oil" capable of yielding gasoline. To bring about this change, the oil or wax is heated in a tight vessel, but it is apparently necessary that the ratio of the volume occupied by the substance to the empty space above it should not vary above or below certain limits. Not less than one-tenth of the vessel nor more than one-half must be occupied by the oil, otherwise the change does not take place. The reason for this remains yet undiscovered, but the advantages of being able to obtain gasoline from a great variety of substances instead of from only one is obvious.

W. A. Hall, an American inventor, has patented in England a process which he described as follows: "I take a cheap hydrocarbon, such as gas oil, and I subject this to a temperature of about 650°C., under a pressure of about 70 pounds to the square inch in a suitable coil of pipe, whereby the oil is cracked and a considerable portion gasified. From this coil of pipe, called a 'converter' the mixture of oil vapor and gas produced is passed through suitable coolers whereby the temperature of the mixture is lowered to about 200°C., and the mixture fractionally condensed in a suitable separator with or without reduction of pressure. Those portions of the mixture nonvolatile at about 200°C. are thus extracted in the liquid state. The gas and the remaining fractions of liquid, volatile at the approximate temperature of 200°C., may, if the pressure has not been reduced, be conducted directly through a cooler and condensed under the pressure of the converter, or, if the pressure has been reduced in the separator, may be recompressed by means of any suitable mechanical compressor, and then condensed under pressure in the cooler." A plant yielding about 6000 gallons daily of this "motor spirit" was erected in England and the product taken over by the British government.

By the discovery of these processes the United States thus became independent of foreign manufacturers; for by their use not only was cheaper gasoline possible, but the crude materials, notably benzol and tuluol, used in the manufacture of explosives, coal tar dyestuffs, synthetic drugs, etc., are now readily available. See *The Chemistry of Petroleum and Its Substitutes*, by C. K. Tinker and F. Challenger (London, 1915).

NEW DYESTUFFS AND PROCESSES. The establishment of new plants in the United States and the allied countries led to the publication of improved processes and of new dyestuffs. The most important in the United States was the formation of the Pearsite Company with a capital of \$2,000,000, and with the equipment of a large plant in Cannel City, Ky. For this corporation the announcement was made that their operations were based on a new process

dependent upon the use of oxidized cannel coal. In September they began the delivery of the following colors: a sky blue, a direct black, a benzol red, a wool black, and a direct green. The output at first was 5000 pounds of colors a week, but the expectation was of reaching 40,000 pounds a day when the plant was in complete running order. H. A. Frasch, a New York chemist, revived his discovery of "petracin," a compound made from the sludge acid of petroleum refining and from which he had been successful in making a series of colors and dyestuffs. From England came the announcement early in the year of the successful employment of sulphur dyes for dyeing wools and fabrics other than cotton (for which sulphur dyes have been hitherto exclusively applied). It had been discovered that these sulphur dyes might be used with success for wool, silk, artificial silk, hemp, and other fibres, which can be dyed either separately or in combination. As sulphur dyes are cheap and will, as opposed to aniline dyes, add to the properties of milled cloth, the new process is a valuable one. During the year it was announced that the chemical department at Leeds University in England has succeeded in manufacturing a cheap dyestuff for use in dyeing khaki for soldiers' uniforms. Formerly England was compelled to use dyestuffs of German manufacture on all khaki cloth. See *Dyestuffs and Coal Tar Products*, by Thomas Beacall and others (London, 1915).

DYESTUFF SITUATION IN THE UNITED STATES. In August, 1914, in consequence of the war in Europe the importation of dyestuffs practically ceased. At that time the consumption of artificial dyestuffs, derived chiefly from coal tar products, had an annual value of about \$15,000,000, of which the imports from Germany were \$7,850,000, Switzerland \$910,000, and Great Britain and other countries \$370,000; with added amounts paid for duties, about \$2,000,000, and expenses and profits, the sum annually expended for foreign coal tar dyes exceeded \$12,000,000. Besides the textile industries, the paint, varnish, and ink trades, the paper industry, the feather and leather trades, and other minor industries were threatened with disaster unless some means were devised to furnish them with the needed coloring materials. Accordingly on January 26th, the United States Senate directed the Secretary of Commerce to report fully the facts relating to the supply of dyestuffs for American textile and other industries, as well as the sources of such supply, the extent and nature of the supply, and similar information. The duty of gathering this information was assigned to the Bureau of Foreign and Domestic Commerce, and Dr. Thomas H. Norton, the well equipped and expert chemist, prepared a preliminary report on *Dyestuffs for American Textile and other Industries*, which was issued over date of March 20th. Meanwhile at the beginning of the year there were four establishments in the United States having an annual output valued at about \$3,000,000. Each of these plants specialized in their products for some particular trade as woolen goods, cotton, paper, etc.

The problem therefore was how to increase the output from various sources to meet the demands for dyestuffs that formerly came from abroad, and also how to retain the industry permanently in the United States. One important element in the demonstration of the power

of what American ingenuity, enterprise, and capital were capable of, was the National Exposition of Chemical Industries, held in September, where it was shown that the output of dyestuffs had quadrupled within the year. The field was one that offered considerable promise, and soon many of the American coke ovens equipped their plants with appliances for the production of coal tar bases from which the dyes were manufactured. The most difficult part of the problem was the manufacture of the intermediate compounds from which the finished dyes are produced. Of these aniline oil is the most important and by May it was officially reported that the supply of this article was sufficient to meet the demands of the dyestuff makers in the United States. New corporations with ample capital were organized by large financial interests, such as the Du Pont Company of Delaware and the Standard Oil Company of New York and numerous plants in various places were started. New and improved processes, and new dyes were constantly reported during the year. A report issued by the Bureau of Foreign and Domestic Commerce towards the close of the year showed the 1915 production of American coal tar dyestuffs to be at the rate of approximately 9000 short tons a year, whereas in 1913 the rate was 3000 tons. It was now confidently expected that by the end of 1916 the output would reach 16,000 tons as against 22,000 tons imported from Germany in 1913. In that year practically all of the intermediates used by domestic color manufacturers came from abroad; at the end of 1915 they were produced in the United States. It was predicted that by 1920 the great bulk of artificial dyes consumed in the United States would be made in America from American raw materials. The cost of production and the selling prices of these materials were higher than those of similar products when imported, but it was demonstrated during the year that the United States could produce sufficient coal tar raw material for the needs of a complete domestic coal tar industry inclusive of explosives and dyes, provided there was a certainty of outlet as to volume and continuity. Attention was called to the fact that domestic manufacturers were prohibited by law from making use of cooperative devices, such as pools, trusts, manufacturing and selling agreements, and the like, while such devices were regarded as lawful and encouraged by European governments, so that alterations in the tariff were essential in which the consumer in the first place, and the public in general must share in the burden imposed if the dyestuff industry, so auspiciously started, was to be preserved in the United States.

THE DYESTUFF SITUATION IN EUROPE. The conditions in Great Britain, France, Italy, and elsewhere in Europe were somewhat similar to those described as existing in the United States. In England, without attempting to discuss the details, the conditions were met by the organization of a national company in Manchester incorporated as the "British Dyes (Ltd.)" with a capital of £2,000,000 which the government increased by £1,500,000 at 4 per cent to be paid in 25 years; also the government added £100,000 for a research laboratory. The largest existing plant in England for the manufacture of aniline dyes at Huddersfield was secured and actual manufacture began in May. It was believed

that from these works the greater portion of the artificial dyestuffs required in England could be supplied. The vogue for brown in 1915 was said to be due to the existence of large stocks of this color in England at the beginning of the war, and with its exhaustion gray was said to have become fashionable.

From Italy came reports of shortage of dyestuff, resulting in the closing of dyeing establishments. The factories used for the production of munitions of war, it was said, would be converted into plants for the manufacture of dyestuffs when hostilities cease. In Russia a project for the manufacture of coal tar colors was advanced. It was to have a capital of \$5,000,000, of which about one-half was to be supplied by firms requiring dyestuffs in their business. In France a similar plan was adopted. A national company was organized with an initial capital of \$10,000,000, the government to advance \$5,000,000 at the rate of \$1 for every \$5 subscribed by the public and an additional \$2,500,000 at the rate of \$1 for every \$4 subscribed. For the government advances 4 per cent was to be paid. A grant of \$500,000 for a research laboratory was also made by the government. The condition in Switzerland became a most peculiar one. The factories in that country were dependent upon Germany for their crude material, but at the beginning of the war Germany declined to furnish any more crude materials unless Switzerland would refuse to export the finished dyestuffs to countries with which Germany was at war. As the manufacturers in Basel declined to do this they soon found themselves compelled to close their factories. Under these circumstances they made overtures to American manufacturers for crude materials, agreeing to pay for them with finished products. See *The British Coal-tar Industry, Its Origin, Development, and Decline*, by Walter M. Gardner (London, 1915).

COTTON SUBSTITUTES. Since the beginning of the war in Europe there was an unusual demand for cotton, both for use in the manufacture of explosives, as gun cotton, and in medicine, as absorbent cotton. Reports from Germany indicated the use of ordinary wood pulp as a basis for high explosives, although the presence of rosin and oxy-cellulose renders its action uncertain as well as highly dangerous to those manufacturing the explosive. French experts reported that the ballistic power of nitro-lignose was not equal to that of gun cotton. "Lignin" is made of pine cellulose and is sold in Berlin as a substitute for absorbent cotton. It was said to absorb blood better than cotton but was not as good a dressing for a wound. In Sweden cellulose wadding from chemical wood pulp was made for dressing wounds. It is sold in thin sheets, like tissue paper, but crimped. The English found the bog moss, *Spagnum cymbilifolium*, of great value as a surgical dressing. It is antiseptic, soft, light, and cool, and has only to be sterilized and placed in flannel bags for use.

ASPHYXIATING GASES. A curious phase of industrial chemistry was to be found in the use of poisonous gases for the injury of combatants in warfare. This method of destruction called upon knowledge from most of the arts and sciences and each step in the evolution of its use was an additional application of scientific knowledge. As used in May, Sir John French reported that the gas was emitted from cylinders

during a period of four and a half hours. The greenish color, the strong odor, and the great density of the gas, causing it to flow along the ground seemed to indicate that it was chlorine; moreover, the symptoms of those inhaling it tended to confirm this opinion. Later it was said that three kinds of gas were used, namely, chlorine, bromine, and nitrogen peroxide. The last was described as paralyzing the soldiers from their waist down. According to German authorities the gas was described as a synthetic product of some complexity, the ingredients so far defying analysis. Sodium sulphate and oxygen are said to be used to neutralize the effects of these gases. Masks impregnated with neutralizing chemicals were used, and those employed by the Germans were said to contain sodium hypophosphite. According to the *Bulletin* of the Alliance Française, a "liquid fire" was also used. This was emitted from portable fire extinguishers that throw out a flame that burns immediately and spontaneously. The waves of flame had an effective length and breadth of 20 meters. They had immediate and deadly effect and they drove back the enemy as a result of their development of heat. The translated orders for the use of these "flame projectors" said: "As they burn for a duration of a minute and a half to two minutes, and as they can be interrupted at will, it is recommended to make only isolated and brief jets of flame so as to be able to fight against several objectives with a single filling dose."

CHEMISTRY, ORGANIC. See CHEMISTRY, GENERAL PROGRESS OF, under section so entitled.

CHENG TSENG JU. Chinese admiral and administrator, assassinated Nov. 10, 1915. He was formerly commander of the Chinese navy, and during the revolution of 1913 was active against the revolutionists. He was a member of the Monarchist party. With his private secretary he was traveling to the Japanese Consulate at Shanghai to attend the coronation reception, when he was fired upon by two revolutionaries, and was fatally wounded.

CHESS. Activities in chess were naturally lessened during 1915 as a result of the European war, but several interesting matches were contested in the United States. José R. Capablanca was the central figure, perhaps. The Cuban champion, on February 22nd, in Brooklyn, played sixty-five games simultaneously against eighty-four opponents. This feat appeared to have been an inspiration to F. J. Marshall, the United States champion, for later in the year at Portland, Ore., he conducted games on ninety-two boards at one and the same time.

The most important tournament was held in Brooklyn from April 19th to May 10th, there being eight competitors, including Marshall and Capablanca. The latter won the first prize with thirteen victories and one defeat. Marshall finished second, winning twelve games and losing two. O. Chajes and A. Kupchik divided the third and fourth prizes, each capturing seven games and losing a like number.

The annual championship tourney of the New York State Chess Association resulted in a victory for A. Kupchik, who won all four of his games. The Brooklyn Chess Club won the second annual championship tourney of the Metropolitan Chess League, the individual honors going to Edward Lasker.

The twenty-third annual tournament of the American Quadrangular College League was won by Columbia with 10 victories and 2 defeats. Princeton was second, winning $5\frac{1}{2}$ games and losing $6\frac{1}{2}$, and Harvard third with a score of 5-7. Yale was last, losing $8\frac{1}{2}$ games and winning only $3\frac{1}{2}$. The Triangular College League contest resulted in a tie between Cornell and Pennsylvania, each team winning 12 games and losing 4. Brown failed to make a single score.

CHESTERTON, GILBERT KEITH. See LITERATURE, ENGLISH AND AMERICAN, *Poetry*.

CHEYNE, THOMAS KELLY. English Hebraist and Bible critic, died Feb. 16, 1915. He was born in London in 1841; educated at Worcester College, Oxford, and Göttingen; and in 1868 appointed a Fellow of Balliol College. His writings on subjects connected with the Bible began in that year, and continued practically until his death. From 1885, he was rector of Tending, Essex. Of the Old Testament Revision Company he was, in 1886, a member, and was Bampton lecturer in 1889, and American lecturer on the history of religions in 1897-98. In some respects, he was generally the most original writer among the English scholars of his time who devoted themselves to Old Testament studies. In recent years the special theories which he advocated failed to win acceptance. From 1885-1908 he was Oriel Professor of the Interpretation of Holy Scripture at Oxford, from which position ill health compelled him to resign, after which he was made professor emeritus. His published writings include: *Notes and Criticisms on the Hebrew Text of Isaiah* (1868); *Job and Solomon* (1887); *Foundations of Old Testament Criticism* (1894); *Jewish Religious Life after the Exile* (1898); *The Christian Use of the Psalms* (1899); *The Decline and Fall of the Kingdom of Judah* (1908); and *The Two Religions of Israel* (1910). He was an editor of the *Encyclopædia Biblica* and the *Critica Biblica*. He also contributed articles on religious subjects to the *Encyclopædia Britannica*. He received the honorary degrees of D.Litt. and D.D.

CHICAGO. See ILLINOIS.

CHICAGO, UNIVERSITY OF. An institution for higher education founded in Chicago, Ill., in 1893. The total enrollment in all departments in the autumn of 1915 was 4324. The faculty numbered 314, not including assistants and special lecturers. There were no notable changes in the faculty during the year, and no noteworthy benefactions were received. The productive funds at the end of the fiscal year amounted to \$19,446,184, and the income was \$1,094,253. The library contained at the same date 431,544 volumes.

CHICAGO, ROCK ISLAND, AND PACIFIC SITUATION. See RAILWAYS.

CHILD LABOR. While no striking events occurred in 1915 in the development of child labor restrictions the progress of recent years was maintained. In a number of States campaigns were carried on to improve child labor laws. Some of the improvements sought were the 14 year age limit; the eight-hour day; no night work under 16; regulation of street trades; issuance of work permits including proof of age; educational qualifications; and physical examinations. The regulation of home work in the large cities has come to be one of the most serious problems confronting those working for

improved conditions in Northern States. Thus in New York City alone there are 13,000 licensed tenement houses, each with from 1 to 40 families where children may be employed. It is almost impossible to prevent the employment of children even of ages 4 and 5 in home work. Here is the stronghold of the sweated trades. The solution advocated by many is the complete prohibition of home industries, thus forcing the trades into regular factories where inspection is easy and sanitary regulations can be enforced. In New York, also, the canning industry proves difficult to control. Out of 42 canning companies prosecuted by the State Labor Department, only 2 were convicted and these were fined only \$20; in such cases local sentiment plays a determining part. In North and South Carolina effort was made to secure a 14-year age limit and an eight-hour day, and an increase in educational requirements. In Illinois, California, Connecticut, Michigan, Minnesota, and Missouri child labor committees were at work to secure protection for young children from the moral dangers of street trades and to limit hours of work to eight per day. In Texas they sought to extend the present age limit to a number of occupations not now covered and also to limit the number of hours of work. In Utah and Maine they endeavored to extend the 14-year limit to occupations other than those in factories, and provide an eight-hour day and no night work. In Vermont the programme was to extend the 14-year limit to occupations not now considered and prohibit work under 16 in quarries and dangerous occupations. New York advocates worked for the eight-hour day. In Pennsylvania committees tried to abolish the exemption law allowing boys under 14 to work at night in glass factories, to regulate street trades, and to require physical examinations. The Oregon Board of Inspectors of Child Labor noted a decided change in the character of applications for permits during the past two years, due to three causes: (1) less effort to employ very young children in store, shop, or factory; (2) better coöperation of school authorities; (3) rulings of the Industrial Welfare Commission as to the minimum wage law. Many firms refuse to employ children under 16.

IN CONGRESS. For several years the passage of a national child labor law under the authority of Congress to regulate interstate and foreign commerce has been agitated. This resulted early in the year in the passage of the Palmer-Owen Bill by the House by a vote of 237 to 45. A long filibuster by Senator Overman of North Carolina prevented it from passing the Senate before adjournment in March. The bill aims to remove the disadvantages which the States not employing child labor are placed under, when competing with those which permit it, by forbidding the shipment in interstate commerce of the products of mills, factories, and canneries upon which children under 14 have been employed and of products of mines or quarries employing children under 16, or of any products on which children of 14 to 16 have worked at night or for more than eight hours a day. Among the Representatives voting against the bill by States were: Georgia, 9; North Carolina, 7; Mississippi, 6; Texas, 5; South Carolina, 5; Alabama, 3; all of these States are backward in child legislation.

LEGISLATION. The principal child labor enact-

ments of the year were the following. A bitter fight in the Alabama Legislature did not succeed in reducing the number of hours per week below 60, but a law was passed raising the age limit to 14 years after 1916 in all occupations, including street trades; provisions for enforcement were strengthened. California fixed 10 years as a minimum for street trades. Delaware established an unpaid labor commission to have charge of the women and child labor inspectors. Florida enacted a compulsory education law operative when adopted locally and strengthened the child labor law. Iowa limited the hours of children under 16 to eight per day and regulated street trades and messenger service. Maine passed a nine-hour day and 54-hour week law for children under 16, canneries being excepted from its operation. The Missouri Senate appointed a commission to draft a code of laws relating to children. Pennsylvania took a long step forward in child labor legislation by providing a 51-hour week, and a 14-year age limit. It was required that for children of ages 14 to 16 eight hours out of the 51 per week must be devoted to vocational training wherever facilities exist. An appropriation of \$1,000,000 was made to provide suitable schools. It was estimated that there were employed in Pennsylvania industries nearly 30,000 girls and over 46,000 boys of ages 14 to 16 or under. Many thousands of the boys had been employed as breaker boys at coal mines and as carriers in glass factories, but machines had already been installed in some places to do this work. In South Carolina and Texas compulsory school attendance laws were passed, the latter applying to ages up to 14, but the former being optional with each district as to age limit. A new Michigan law raised the age limit during school hours to 15 years, and prohibited child labor in certain occupations deemed inimical to health and morals. Utah forbade employment of children under the age of 14 in or about places where tobacco is sold or in any pool room. Wyoming forbade the employment of children under 18 years in breweries, saloons, or concert halls, or under 14 as messengers to such places; and established a nine-hour day for children under 14 years.

THE ELEVENTH ANNUAL CONFERENCE under the auspices of the National Child Labor Committee was held at San Francisco late in May. It was preceded by a joint conference of that Committee with the Southern California Child Labor Committee at Los Angeles. The session at San Francisco included an impressive pageant designed to impress upon the West the advantages of restricting child labor before it became a problem. A session was devoted to the proposed Federal children's charter (see below), and there was considerable discussion of a Federal child labor law. Other subjects included the struggle for better conditions in the South; street trades in California; and local needs of western communities.

FEDERAL CHARTER. At the 1914 and 1915 sessions of the National Child Labor Committee there was considerable discussion of a proposed national children's charter. This was first suggested by Roger N. Baldwin of St. Louis and strongly advocated by Edward N. Clopper. A committee, lead by C. C. Carstens of the Massachusetts Society for the Prevention of Cruelty to Children, was appointed to further the idea. It enlisted the support of numerous agencies,

including P. P. Claxton, Commissioner of Education, and Julia C. Lathrop of the Children's Bureau. The proposal is based on the belief that all child welfare activities should be co-ordinated under a systematic and well-reasoned plan. It is pointed out that multitudes of agencies are now in the field, each striving to promote its own activities, whereas with co-operation and a unified goal much more effective work could be done. As outlined by Mr. Claxton of the National Child Labor Committee this charter would include three principal sections. One of these dealing with the "preservation of life and health" would outline the principles to govern the segregation of the unfit; requirements of physical fitness for marriages; freedom of mothers from toil before and after confinement; responsibility for illegitimacy; birth registration; medical inspection; district nursing; pure food; and administration. Another section dealing with "protection from want, abuse and crime" would include "care of dependent, neglected and delinquent children"; protection from cruelty and premature toil; age of consent; juvenile courts; and "protection from demoralizing conditions." A final section dealing with "education and recreation" would cover school laws, industrial training, vocational guidance, social centres, parks and playgrounds, and libraries, and their administration. It was not contemplated that such a charter would include specific legislation but rather a collection of fundamental principles.

NEW YORK. The report of the Commissioner of Labor of New York for the year ending Sep. 30, 1914, gave the results of the efforts of the Division of Mercantile Establishments of the Bureau of Factory Inspection to determine the extent of child labor in mercantile establishments within the State. Nearly 25,000 inspections were made; 7500 children were found employed, of whom 2607 or 34.8 per cent were illegally employed. Of those illegally employed 1761 were of ages 14 to 16, but lacking certificates, while 846 were under 14 years of age. During the year 717 proceedings were begun for violations of the mercantile law, in 611 of which convictions were secured, while 51 were dismissed and 8 withdrawn. Of the 717 proceedings, 531 were for the illegal employment of children. The remainder related to the hours of women and minors, sanitation, and the day of rest provision.

SWITZERLAND. In a new Swiss law, the minimum age of employment was put at 14 years. In addition children under 16 were not to be employed where the normal hours of labor (10 hours per day) are exceeded, or nine hours on Saturdays and days preceding holidays. The Federal Council may further designate occupations at which persons under 16 may be employed. For children under 16 who are still attending to their religious instruction and schooling, the daily hours of attendance, together with their hours of labor in the factory, must not exceed the prescribed maximum of 10 hours.

GREAT BRITAIN. A conservative estimate of the boys and girls under 14 years of age employed for wages in the United Kingdom placed the number at 577,321. Of these 34,535 were half-timers, mostly in the cotton mill centres. About two-thirds of the total were boys. These figures revealed the great importance of the effort being made to raise the age limit, intro-

duce uniformity in legal requirements, and greatly extend the educational opportunities. At present there is a great lack of uniformity in child labor laws in England, Scotland, and Ireland; and this is aggravated by differences in educational facilities and requirements. This situation is primarily due to the fact that local authorities are given discretion in the enforcement of many features of child labor laws.

CHILDREN'S CHARTER. See **CHILD LABOR, Federal Charter.**

CHILDREN'S COURT. See **JUVENILE COURT.**

CHILDREN'S DISEASES. See **HYGIENE.**

CHILE. A republic south of Peru on the Pacific coast of South America. The capital is Santiago.

AREA AND POPULATION. Chile comprises 23 provinces and one territory, with an area officially estimated at 757,366 square kilometers (292,419 square miles). Its length from the Peruvian boundary to the southern limits of South America is about 4230 kilometers; its width, though varying, may be stated as approximately 285 kilometers. The census of Nov. 27, 1907, returned a population of 3,240,279; the estimated population at the end of 1912 was 3,505,317. The population of Santiago is estimated at upwards of 400,000, and of Valparaiso 200,000. Population of the larger cities (1907 census): Santiago, 332,724; Valparaiso, 162,447; Concepción, 55,330; Iquique, 40,171; Talca, 38,040; Chillán, 34,269; Antofagasta, 32,496. For all of these cities estimates have been published very much higher than the foregoing figures, but, while undoubtedly there has been a considerable increase since 1907, the estimates are probably excessive.

Marriages, as reported for 1912 and 1913 respectively, 21,258 and 21,341; births, 135,373 and 139,974; deaths, 103,905 and 111,225; excess of births, 31,468 and 28,719. Immigration in 1910, 2651; in 1911, 863; in 1912, 1839.

EDUCATION. Primary instruction is free, but not compulsory, and there is a low average attendance at the schools. In 1914 there were 3040 public primary schools, with 317,525 pupils, and 483 private primary schools, with 56,950 pupils; 86 public and 117 private secondary schools, with 25,217 and 17,181 students respectively; 12 public and 7 private higher grade schools, with 2457 and 828 students; 11 public and 10 private commercial schools, with 3728 and 1683 students; 7 public and 7 private special schools, with 1851 and 653 students; 16 public and 2 private normal schools, with 2641 and 723 students. In addition there are various technical and professional schools. There are two universities, which, in 1912, had 3217 students. The state religion is Roman Catholicism, but religious toleration prevails.

PRODUCTION. In the year 1911-12, the area under cultivation was 1,233,663 hectares, or 1.62 per cent of the area of the country; of the cultivated area, 47.4 per cent was planted to cereals. Some of the important yields are reported as follows: wheat, 3,262,000 metric tons in 1913-14, and 6,203,000 in 1914-15 (the average for the years 1905-6 to 1914-15 was about 5,375,000 metric tons); barley, 1,250,000 tons in 1913-14; oats, 644,890 tons in 1912-13; corn, 418,356 tons in 1912-13; potatoes, 2,627,954 tons in 1911-12, and 2,382,244 in 1912-13; wine, 1,964,380 hectolitres in 1911-12, and 2,262,853 in 1912-13.

Live stock (1913): horses, 457,840; asses, 32,892; mules, 38,193; cattle, 1,968,620; sheep, 4,602,317; goats, 299,381; swine, 221,384.

Chile owes its prosperity largely to its mineral resources. Coal is mined, though not in sufficient quantities for home consumption. The production of copper, for which the country was once famous, greatly declined, but in recent years the output has been increasing. The value of the gold and silver produced is comparatively small. But the leading mineral, and by far the country's greatest single source of wealth, is sodium nitrate, produced in the arid north, in Antofagasta and Tarapacá, and widely used as a fertilizer. The nitrate export in 1913 was about 60,000,000 metric quintals.

COMMERCE. Imports and exports have been valued as follows, in thousands of dollars:

	1910	1911	1912	1913	1914
Imports	108,582	127,381	122,076	120,274	99,828
Exports	120,022	123,884	139,878	144,658	109,382

Larger classified imports in 1914, in thousands of dollars: oils, varnishes, paints, and coal, 18,478; textiles, 17,838; mineral products, 15,973; vegetable products, 14,162; machinery, tools, apparatus, etc., 11,193; arms, ammunition, and explosives, 8639. Classified exports in 1914 were as follows, in thousands of dollars: mineral products, 93,208; animal products, 7966; vegetable products, 6082; various, 2124. Trade by principal countries, in thousands of dollars:

	Imports		Exports	
	1913	1913	1913	1913
United Kingdom	38,617	36,028	55,103	55,678
Germany	33,189	29,579	28,061	30,830
United States	16,800	20,090	24,515	30,419
France	7,261	6,623	7,669	8,858

COMMUNICATIONS. The following account of Chile's railway extension is taken from a monograph published in 1915 by the Pan-American Union:

"During 1913, there were added to the railway lines in operation in Chile 721 miles (1161 kilometers). Of these, 78 miles (126 kilometers) between Osorno and Puerto Montt were of 1.68 meter (standard) gauge; 273 miles (439 kilometers) between Arica and La Paz, of meter gauge; with other 7 miles (12 kilometers) at Arica; also 251 miles (404 kilometers) of meter gauge line on the North Longitudinal Railway, and 112 miles (180 kilometers) on the South Longitudinal Railway. The total of railways in operation at the end of 1912 was 3800 miles (6118 kilometers). At the end of 1913, therefore, the railways of Chile measured 4521 miles (7279 kilometers). There are other lines now under construction which will bring the railways to a total of 5684 miles (9148 kilometers), of which 3541 miles (5700 kilometers) are owned by the government and 2143 miles (3448 kilometers) belong to private concerns. These private lines are principally short railways running from coast ports into the interior, to carry nitrates and other mineral products for shipment abroad. There is, however, among them the Trans-Andean, via Juncal, which joins Valparaíso and Santiago (from Llai-Llai) with Mendoza, through connection having been inaugurated in 1910; and the international railway from Antofagasta into Bolivia to Oruro and La Paz, a distance of 719 miles (1157 kilometers). The great

trunk line of the government system is the Longitudinal, called the Central between Santiago and Valparaíso, 116 miles (187 kilometers), and between Santiago and Puerto Montt, 751 miles (1208 kilometers), the southern portion of this, from Osorno to Puerto Montt, having been opened to traffic in the early months of 1913. The Longitudinal Railway north of Valparaíso, at present open to Copiapó, was opened in November, 1913. Another important government railway, built with the coöperation of Bolivia, connects Arica with La Paz, a distance of 273 miles (440 kilometers), thus offering a short line between the highlands and the coast, somewhat paralleling a traditional trail of the aborigines. This road was opened to traffic during 1913. It is expected that passengers can be carried the entire distance in 15 hours, and suitable cars, with provisions to make rapid ascent and descent comfortable, are installed. The Chilean government is projecting the electrification of the section uniting Santiago and Valparaíso, the motive power from the river Aconcagua to be used, and as there are numerous rivers flowing westward from the Andes, power can with little difficulty be obtained for the electrification of the entire system south of Santiago."

In 1915 the Longitudinal Railway, which extends from extreme north to extreme south, a distance of 2132 miles, was completed for 1960 miles, and the line was in operation as far north as Pintados, Chile. A beginning was made with a connecting line from the main line to Iquique on the ocean, but work was stopped for insufficient available appropriation. It was proposed to spend \$134,000 to continue this work. The completion of the Iquique line would open up for development nitrate and other mineral deposits. The connection of the Longitudinal Railway with the ports of Antofagasta and Mejillones was postponed on account of the financial condition of the country, and the first section, which was to start from the main line at Baquedano Station, will probably be built when times improve. The South American Railway from Buenos Aires to Valparaíso was often interrupted by winter storms and was blocked in the mountains of Chile. This led to increased discussion of a second new line for Chile.

Telegraphs at the end of 1913: offices, 808, with 14,884 miles of line and 30,342 miles of wire. Telephone line, 25,430 miles; telephone wire, 36,291 miles. Post offices, 1114. A radio-telegraph system has been installed, with stations at Arica, Antofagasta, Coquimbo, Valparaíso, Talcahuano, Valdivia, Puerto Montt, Punta Arenas, and the Juan Fernández Islands.

FINANCE. The monetary unit is the peso, whose par value is equivalent to 18 pence, or about 36.5 cents. The paper peso fluctuates in value. Accounts of revenue and expenditure are kept partly in pesos gold and partly in pesos paper. Reduced to gold value, revenue and expenditure amounted to 221,332,000 and 235,127,000 pesos respectively in 1912, and 209,783,000 and 216,487,000 in 1913. Estimated expenditure for 1914, 252,568,000 pesos gold and 121,769,000 pesos paper. Customs revenue in 1914 amounted to 112,700,243 pesos gold, as compared with 158,070,367 in 1913. Customs at the three chief ports in 1913 and 1914 respectively were: Antofagasta, 38,221,531 and 30,268,639 pesos gold; Valparaíso, 38,936,176 and 25,853,856; Iquique,

33,755,714 and 25,229,727. On Jan. 1, 1914, the foreign debt was £33,912,340; internal debt, 155,822,535 pesos paper (equivalent to 32,920,839 pesos gold).

ARMY. Military service in Chile is compulsory under the terms of a law enacted Feb. 12, 1896, which requires men over 20 to receive military instruction. The military organization thus formed is called the National Guard, and the first draft under the law was made in 1901, when recruits were held for four and one-half months' service. This period obtained until 1903 when it was increased to six months, and in 1908 it was increased to one year, the recruits being called in two classes every six months. This division of recruits was being criticised by the military authorities who favored a single draft of the entire contingent, and at the same time there was a movement to increase the length of service to two years or at least to 18 months, and provide for a reserve. Various schemes have been suggested to ensure the registration of all men available for service, and it was proposed to deny the right of suffrage to all not exhibiting certificates of having performed military service.

NAVY. The Chilean navy includes two old battleships (*Capitán Prat* and *O'Higgins*), aggregating 15,600 tons; one armored cruiser (*Esmeralda*), 7000 tons; 4 protected cruisers, 14,500 tons; two torpedo cruisers, 1470 tons; and a number of smaller craft, including destroyers, torpedo boats, and two submarines.

GOVERNMENT. The executive authority is vested in a President, elected indirectly for five years and ineligible for the next succeeding term. He is assisted by a responsible ministry, and by a Council of State, which includes five members nominated by himself and six chosen by the Congress. The latter body consists of two houses, the Senate and the Chamber of Deputies. Senators, numbering 36, are elected for six years, and deputies, 118 in number, for three years. For the term ended Dec. 23, 1915, the President was Ramón Barros Luco, who was succeeded on that date by Juan Luis San Fuentes.

HISTORY. *Internal Conditions.* Chile was affected by the European war in much the same way as the other South American republics. Her credit in Europe was suspended, her export market was destroyed, and her imports had to be secured from new sources. The country suffered most through the destruction of the export market as it depended largely on its foreign sale of nitrate and guano. The failure of Europe to contract for the purchase of these products brought about a graver and more prolonged economic crisis than was experienced by the other nations of South America. The withdrawal of European support opened an opportunity for American enterprise and capital, and a close relationship between the financiers of the two countries was brought about by means of the Pan-American Congress held at Washington in May. Señor Don Juan Luis San Fuentes was elected President of the Republic in May, and his election was confirmed by the two houses of the Chilean Congress on September 17th.

Chilean Relations with Foreign Countries. One of the first official acts of the year on the part of the Chilean government was to order the German auxiliary cruiser *Sacramento* to leave the port of Valparaíso within 24 hours or be interned. Several days later the government

ordered the expulsion from Chile of two Peruvian politicians, ex-President Guillermo Billinghurst (see YEAR BOOK, 1914, PERU) and Dr. Augusto Durand, who had been exiled from Peru and were now proving troublesome to Chile.

On April 2nd a British squadron appeared in Chilean waters and opened fire on the German battleship *Dresden* which the Chilean government had ordered interned. The Governor of one of the islands adjacent to the mainland attempted to reach the British flagship to warn the commander that he was violating international law by firing within the three-mile mark in neutral waters, but the firing from the British fleet compelled him to turn back. The captain of the *Dresden*, rather than lose his ship to the British, set fire to the magazine and blew up the vessel. Chile immediately demanded an apology from Great Britain for this insult to her sovereignty, and Sir Edward Grey acknowledged that the British commander had erred in firing on the ship within the limit set by international law and apologized for the act. Germany became incensed at the action of the Chilean government in accepting this apology and a sharply worded note was sent to the South American republic acquainting the government with Germany's displeasure. Chile responded with a like note, demanded an apology from Germany for her inexcusable action of overstepping the bounds of international law, and for a time it appeared that Chile might be drawn into the conflict. The matter, however, was subsequently settled without recourse to arms. On May 25th Señor Alejandro Lira signed the ABC peace treaty at Buenos Aires, at the same time that the representatives of Brazil and Argentina affixed their signatures to the document which was aimed to bring about a lasting peace between the countries of Latin America. In April Chile decided to send representatives to the Pan-American Congress at Washington and appointed as delegates Luis Izquierdo, former minister of foreign affairs, Augusto Villanueva, Director-General of the Bank of Chile, and Luis Aldunate, a private banker. These delegates proposed, among other things, a direct line of steamships between the United States and Chile in order that closer trade relations between the two countries might be established.

CHINA. The Chinese Empire became the Chinese Republic Feb. 12, 1912, following a revolution ended by the abdication of the infant Emperor Pu-yi. The capital is Peking.

AREA AND POPULATION. The republic consists of China proper, or "the 18 provinces," Manchuria (3 provinces), Sinkiang province (including East Turkestan), and Mongolia and Tibet (dependencies). In recent years there have been several revolutionary movements of more or less magnitude in the dependencies, especially Outer Mongolia; and the autonomy of the latter was recognized by the Peking government in a convention with Russia signed in October, 1913. The population of China is not definitely known. For many years it was expressed by the round number 400,000,000. The estimates of the Maritime Customs for 1912 showed a total for China proper and Manchuria of 437,996,000. Various estimates and enumerations have been made under governmental authority, but with so complete an ignorance of statistical method that they command little confidence. There is reason to believe, however,

that the number of inhabitants is fairly represented by the returns of the 1910 census, based on an enumeration of households. This enumeration tends to confirm the opinion held by some authorities that the traditional 400,000,000 and the estimates of the Maritime Customs are greatly excessive. Moreover, it seems not improbable that the population has increased very slowly if at all. The census returns shown below by provinces are exclusive of children under six years old; these are estimated at 9,000,000. In the case of Szechwan, a figure reported by the viceroy, and regarded as being more nearly accurate than the census figure, has been substituted for the census figure.

	<i>Sq. miles</i>	<i>Pop. 1910</i>	<i>Capital</i>
Anhwei	54,826	14,077,683	Anking
Chekiang	86,680	13,924,655	Hangchow
Chihli	115,830	22,970,654	Paoitingfu
Fukien	46,832	8,555,678	Foochow
Honan	67,954	22,375,516	Kaifeng
Hunan	83,398	20,583,187	Changsha
Hupeh	71,428	21,256,144	Wuchang
Kansu	125,483	3,807,883	Lanchowfu
Kiangsi	69,498	16,254,374	Nanchang
Kiangsu	38,610	15,379,042	Nanking
Kwangsi	77,220	5,426,856	Kweilin
Kwangtung	99,970	23,696,366	Canton
Kweichow	67,182	9,266,914	Kweiyang
Shansi	81,853	9,422,371	Taiyianfu
Shantung	55,984	25,818,685	Tsinan
Shensi	75,290	6,726,084	Sianfu
Szechwan	218,533	54,505,600	Chengtu
Yunnan	146,718	8,049,672	Yunnanfu
China proper.	1,532,789	*302,111,334	Peking
Heilungkiang ..	202,708	1,562,254	Tsitsihar
Kirin	105,019	5,349,287	Kirin
Shengking	54,761	5,830,819	Mukden
Manchuria ..	362,483	*12,742,360	
Sinkiang	550,579	*1,768,560	Tihwafu
Tibetan Marches (of Szechwan and Yunnan)		195,496	
Children under six years (es- timated)		9,000,000	
Total prov...	2,445,851	325,817,750	
Mongolia	1,076,292	11,800,000	Urga
Tibet	766,000	12,000,000	Lhasa
Grand Total.	4,278,143	329,617,750	

* Not including children under six years. † Including Koko-Nor and Tsaidam. ‡ Estimate.

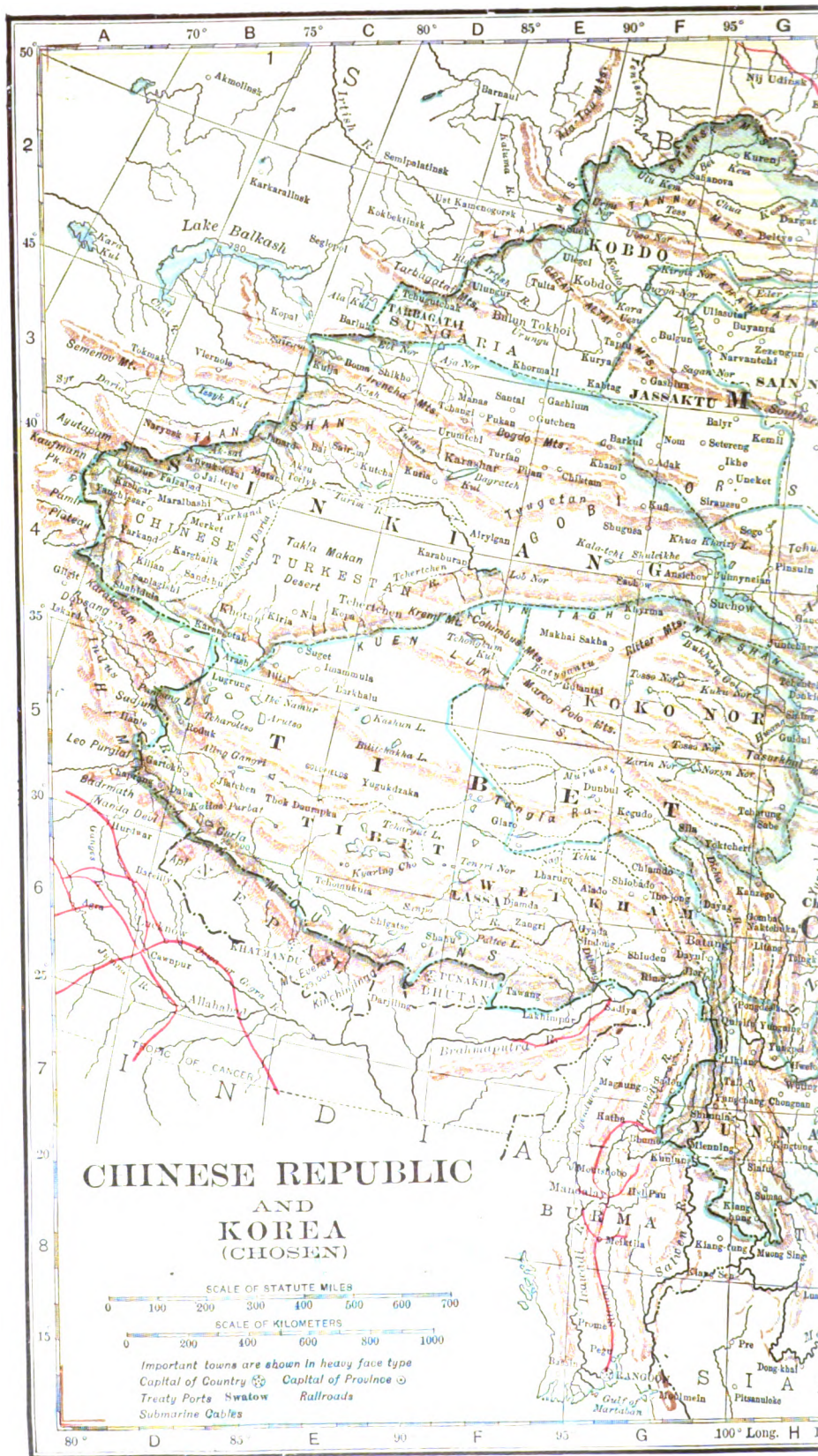
Estimates of urban populations vary widely. According to the 1910 census, Peking had 821,000 inhabitants, this figure including an estimate of the number of children under six years. The population of some of the larger treaty ports has been estimated as follows: Canton, 900,000; Tientsin, 800,000; Shanghai, 651,000; Chungking, 631,700; Foochow, 624,000; Hankow, 596,000; Hangchow, 594,000; Soochow, 500,000; Ningpo, 455,000; Nanking, 269,000; Changsha, 250,000; Chinkiang, 184,000; Amoy, 114,000; Wenchow, 100,000; Shasi, 100,000; Wuhu, 89,000; Nanning, 87,600; Kharbin, 81,400; Swatow, 70,000; Kongmoon, 62,000; Ichang, 55,000. The estimated number of foreigners resident in China in 1913 was 163,827, of whom 80,219 were Japanese, 56,765 Russians, 8966 British, 5340 Americans, 3486 Portuguese, 2949 Germans, 2292 French, and 3810 others.

EDUCATION AND RELIGION. The traditional system of examination in the Chinese classics as the only means to state employment was abolished by the Imperial edict of Sept. 3, 1905.

The government undertook the gradual introduction of Occidental learning, and progress has been rapid. Old style schools still exist in considerable numbers, but the new schools are constantly increasing, and the new education is already widespread. A Board of Education under the central government at Peking has in charge university instruction as well as that of technical and preparatory colleges and higher normal schools. Lower normal schools, middle schools, and primary schools are controlled by the provincial governments. The Imperial University, at Peking, and the university at Tientsin have a European and Japanese staff in addition to Chinese professors. There is a tendency to displace foreign teachers by Chinese educated abroad. There are numerous mission schools and colleges, both Protestant and Roman Catholic. The estimated number of educational institutions of all kinds in China is about 58,000, with an enrollment of some 1,600,000 pupils and students. Translations of foreign books are in increasing demand. There are over 300 daily, weekly, or monthly papers and magazines published in the country.

The religions acknowledged by the Chinese are Confucianism, Buddhism, and Taoism. Under the republic no ecclesiastical hierarchy is maintained, but Confucianism is regarded as the basis of ethical teaching in the system of national education. Mohammedans appear to be fairly numerous, especially in Kansu, Sinkiang, Chihli, and Yunnan. Their number is not known even approximately; formerly it was supposed to be about 30,000,000, but recent estimates place it between 5,000,000 and 10,000,000. At the end of 1912, European Roman Catholic priests are reported to have numbered 1423, and Roman Catholic native Christians 1,531,216. Foreign members of Protestant missions in 1913 are reported at 5449, including 1060 ordained ministers; the number of Protestant native Christians was stated at 356,209.

INDUSTRIES. China, though rich in minerals, is a distinctly agricultural country. The principal crops, in the north, are wheat, barley, corn, millet, and other cereals, and beans and peas; in the south, rice, sugar, indigo, and cotton are grown. Tea is an important product in the south and west, as also are silk cocoons, which to some extent are produced in all the provinces. It has been estimated that about 27 per cent of the world's silk supply comes from China. The tea export in 1913 amounted to 192,181,200 pounds. In the same year, the soy bean, which is the chief crop of Manchuria, was exported to the amount of 620,000 tons. Considerable attention is given to horticulture and the cultivation of many kinds of fruit. Opium was formerly produced in large quantities, but the output, as well as the importation from India, has been greatly restricted, pursuant to government decree and to the Anglo-Chinese treaty of May 8, 1911. The government of India agreed that the export of opium from India to China should cease before 1917, conditionally upon the establishment of proof of the nonexistence of poppy cultivation throughout the republic by that date. No Indian opium may be brought into any Chinese province which has succeeded in suppressing cultivation. At the end of 1914, the only provinces into which the entry of opium was permitted were Yunnan, Kwangtung, Kweichow, Kiangsi, Kiangsu,





Shensi, and Kansu. On the same date, the stock of Indian opium in China was 8100 chests (486 tons). The net import of Indian opium in 1913 is reported at 1088 tons, or 227 tons less than in 1912.

China's progress in mining, as compared with its great mineral resources, is insignificant. Although many mining concessions have been granted to foreigners, the opposition of provincial and other authorities has hindered development. The coal deposits of the country, which are worked to some extent, are known to be among the richest in the world. Of the other minerals worked, the more important are tin (in Yunnan), iron, antimony, lead, zinc, copper, and salt. The tin export in 1913 amounted to 8321 tons.

The leading manufactures are cotton, silk, and woolen goods. Forty-five mills, with 1,250,000 spindles, were reported in operation at the end of 1914. There is some manufacture of iron and steel, especially at Hanyang, near Hankow. A number of modern flour and rice mills have been established.

COMMERCE. In the following table are shown the value in haikwan taels of imports and exports general, and also of the special trade (that is, imports for consumption and exports of Chinese produce). The figures do not include specie and bullion. The average value of the haikwan tael was 65 cents in 1911, 74 cents in 1912, and 73 cents in 1913.

	1911	1912	1913
Imports, gen....	482,576,127	485,726,080	586,290,431
Imports, spec....	471,503,943	473,097,081	570,162,557
Exports, gen....	388,410,350	383,149,432	419,433,420
Exports, spec....	377,388,166	370,520,403	403,805,546

For 1913 the principal imports and the principal exports of Chinese produce are given below, in thousands of haikwan taels:

Imports	1000 tls.	Exports	1000 tls.
Cotton fabrics	109,882	Raw silk, waste, etc.	83,156
Cotton yarns	72,537	Beans and bean	
Opium	41,023	Tea	48,458
Sugar	36,464	Silk mfrs.	33,937
Petroleum	25,408	Hides and skins	21,719
Rice	18,884	Cotton	19,789
Dyes, etc.	17,511	Oils	16,587
Tobacco	16,891	Sesame	12,609
Iron	18,852	Tin	12,372
Fish	12,975	Wheat	10,917
Flour	10,301	Live animals	9,514
Coal	9,492	Wool	6,781
Machinery	7,980	Coal	6,656
Leather	7,179	Straw goods	6,593
Paper	7,169	Peanuts	5,074
Arms, etc.	6,915	Silks	5,038
Copper	6,788	Meats	4,435
Timber	6,687	Matting	3,990
Matches	6,341	Medicines, etc.	3,888
Woolen fabrics	4,879	Timber	3,789
Tin	4,875	Fireworks	3,810
Medicines, etc.	4,027	Paper	3,200
		Fruits	3,142

The tea export amounted to 248,757,333 pounds in 1895, 182,573,064 in 1905, 197,559,867 in 1912, and 191,181,200 in 1913. In the latter year 120,795,600 pounds were exported to Russia, 19,178,000 to the United States, 13,783,600 to Hongkong, and 10,144,800 to the United Kingdom. The trade with Hongkong is principally transit, the imports being chiefly of British origin, while the exports are reshipped to various countries. Trade by countries has been as follows, in thousands of haikwan taels:

	Imports		Exports	
	1912	1913	1912	1913
Hongkong	147,801	171,686	108,384	117,129
Japan	91,017	119,847	45,262	65,544
United Kingdom	74,856	96,911	15,900	16,346
British India	46,646	48,292	7,573	6,190
United States	86,198	85,427	85,050	87,650
Germany	21,180	28,302	14,389	17,025
Russia	21,232	22,153	55,197	44,921
Belgium	8,751	15,831	6,555	6,546
Straits Settlements	8,605	8,985	6,339	7,558
Du. E. Indies	6,048	6,837	1,613	2,605
Macao	6,408	6,596	4,573	4,952
France	2,982	5,300	88,809	40,750
Indo-China	8,319	4,782	1,497	1,887
Austria-Hungary	2,275	4,123	1,873	1,550
Corea	8,155	3,527	5,448	6,813
British America	1,111	1,866	885	652
Netherlands	982	1,424	7,615	8,692
Italy	486	664	10,848	8,318
Other Europe	915	2,052	1,081	968
Other	1,859	2,286	6,739	7,205
Total	485,726	586,290	370,520	403,806
Reexportation	12,629	16,128		
Total net	478,097	570,163	370,520	403,806

SHIPPING. In the direct foreign trade, vessels entered and cleared at the ports in 1913 were as follows:

	Entered		Cleared	
	No.	Tons	No.	Tons
British	4,971	5,127,578	5,095	5,288,289
Japanese	2,880	3,882,664	2,829	3,839,438
Chinese	27,008	2,386,806	26,409	2,322,227
German	691	1,406,086	711	1,481,836
French	801	469,450	297	463,675
Russian	520	422,274	518	422,089
American	232	269,091	221	245,704
Norwegian	141	167,196	134	155,212
Ttl. incl. other	37,307	14,518,224	36,774	14,632,647
Total, 1912	34,543	12,847,881	34,267	13,228,601

COMMUNICATIONS. Throughout the greater part of China proper there are numerous roads, which, though mostly in poor condition, carry a large internal trade. They are supplemented by many canals and navigable rivers, which, so far as commerce is concerned, are probably more important than the roads. The length of railway open to traffic at the beginning of 1914 was reported at 5960 miles (including the Manchurian railways); under construction, 2273 miles. Of the railway in operation, about 1300 miles had been built by British capital. An imperial edict of May 9, 1911, providing for the reversion to imperial control of all trunk railway lines contributed largely to the unrest that culminated in the rebellion of the following October.

The Canton-Hankow Railway, at the end of 1914, was open as far as Wu Shek, 121 miles from the Canton terminus, and in 1915 work was under way on the next section of 19 miles to Shiukuan. The total length of the section to be built by the Canton Company was 214 miles, which would take the line to Ichang, just across the Hunan frontier. The receipts were in excess of expenses and upkeep, and were expected to increase considerably with the extension of the railway to Shiukuan. The Canton-Samshui Railway, 32 miles long, had a good year in 1914, in spite of damage to the roadbed by flood. The Chekiang Railway, which became known as the Shanghai-Hangchow-Ningpo Railway, was formally taken over by the Chinese government and placed under the

control of the Shanghai-Nanking-Hangchow Railway management. It was found that as a result of Chinese construction and management the whole of the rolling stock would have to be replaced and the roadbed relaid. One of the unsolved problems was bridging the Chientang River near Fuyang, but the shifting bottom of the river presents a well-nigh insuperable obstacle. With the delivery of material held up at Tsingtau during the siege, progress was being made with the construction of the bridge near Paikuan. It was believed that the line beyond Hangchow eventually would run via Chiakou and Fuyang to Chuchi, Shaohsing, and Paikuan. Another branch would probably extend from Fuyang to Lanchi, the junction from Chinhua and Wenchow in one direction, and Ch'uchow, Changshan, Yushan, and the Ning Hsiang Railway (Nanking-Hunan), in the other.

Telegraphic communication exists between the principal cities and with adjacent countries. Length of line at the end of 1914, 36,339; of wire, 49,963; offices, 561. There are wireless telegraph stations at Peking, Shanghai, Nanking, Canton, Hankow, and Kalgan. Postal service is maintained in China proper, Manchuria, and Sinkiang. Post offices in 1913, 7808.

FINANCE. Statements of revenue and expenditure are not reported as in western countries. Recent calculations, based upon imperfect data, placed the revenue at 297,000,000 taels, and the expenditure at 576,000,000 taels. Revenue derived from the foreign trade is collected by the Chinese Maritime Customs, originally organized by the late Sir Robert Hart, and under the control of a British inspector-general (F. A. Aglan in 1915). Receipts from Maritime Customs and from opium likin respectively have been: in 1910, 32,732,856 and 2,839,023 haikwan taels; in 1912, 35,526,495 and 4,424,117; in 1913, 40,150,720 and 3,819,133.

The foreign debt, at the end of 1914, is reported to amount to about £173,494,000, including the Boxer indemnity of £67,500,000, and certain treasury bills, etc., approximating £4,000,000.

The haikwan, or Maritime Customs, tael fluctuates with the price of silver. Its average value was about 79 cents in 1907, 65.5 cents in 1908, 63.4 cents in 1909, 66 cents in 1910, 65 cents in 1911, 74 cents in 1912, and 73 cents in 1913; at the end of 1913, it was valued at 72.3 cents, and at the end of 1914 at 66.4 cents.

ARMY. While an elaborate scheme of organization had been prepared for the Chinese army, yet the realization in 1915, due largely to internal political conditions, was far from satisfactory. The actual organization was based on the Imperial edict of 1902, but its execution had been under the direction of the President, Yuan Shi Kai. There was a standing army in which the length of service was three years with the colors, three years in the first reserve, and four years in the second line, which paid about \$3 per month, or better wages than the average laborer. A reservist was paid monthly 75 cents, but has to appear personally and receipt for the same, so it is possible to keep up the organization. The Chinese non-commissioned officers are derived either from the ranks or from special schools, and are required to serve one year longer than the privates. The cadets

receive a preliminary schooling, and then serve with the colors for six months, after which they are two years in a military academy and are commissioned as officers. A War College is designed for exceptional men to give further and more advanced professional training. It was reported in 1915 that Yuan Shi Kai had put 36 divisions into existence, each made up of about 8800 effective troops, and 2000 supply and administrative troops, on the basis of an organization that provided that each division would be increased to about 17,000 and 3000 men, respectively, in time of war. In July, 1914, the army was said to total 130,000 infantry, 12,000 cavalry, 17,000 artillery, with 800 guns, 900 engineers, and 8000 train. In the middle of 1915 100,000 troops of this standing army were said to be in the vicinity of Peking. The infantry was variously supplied with arms, Mauser rifles of two models, a Japanese Murata, and a Mannlicher rifle, predominating. The machine guns are Vickers-Maxim, but the artillery had many old style Krupp pieces, 164 modern field guns and 250 mountain guns, in addition to a varied assortment from different gun makers of the world. Foreign critics believed that the Chinese army might have furnished a substantial resistance to an invasion by Japan, but in its organization and equipment the force was not to be compared with the troops of the neighboring empire.

NAVY. Various plans for reorganization and development of the navy have been officially proposed and discussed in recent years, but little of importance has been effected. Dockyards are inadequate, no proper naval bases exist, and the small and partly antiquated fleet is quite devoid of uniformity. Aside from small craft, the only serviceable vessels are several protected cruisers. Four of them (one of 4300 tons and three of about 3000 tons each) were built in 1897 and 1898. The fifth, the *Ying Swei*, of 2400 tons, was launched at Barrow in July, 1911, and the sixth, the *Chao Ho*, of 2400 tons, at Elswick in the following October; both were completed in 1912, in which year a seventh cruiser of about the same displacement was launched. Besides old craft, there are several destroyers, river gunboats, sea-going gunboats, and torpedo boats.

GOVERNMENT. The Manchu dynasty, which came into power in China, ended with the abdication of the Emperor Pu-yi (reign title Haun-tung), Feb. 12, 1912. Pu-yi was born Feb. 11, 1906, and his uncle, Prince Chun, had acted as regent. The republic established upon the Emperor's abdication was recognized by the United States May 2, 1913, and by other powers Oct. 6, 1913. Yuan Shi Kai was declared provisional president Feb. 15, 1912, and was elected (Oct. 6, 1913), and inaugurated (October 10), as the first constitutional president for the term 1913-18. A new constitution was promulgated May 1, 1914, and an edict was promulgated on December 29 extending the president's term to 10 years, with provision that a two-thirds vote of the Senate might continue it indefinitely. See also section *History*, below.

HISTORY

THE JAPANESE DEMANDS. One of the most significant features of the year was the inability of the Chinese government to resist Japan's insistent demands for special privileges in

China. In view of their extraordinary importance, the Japanese demands are here reproduced in full, as they were contained in the document handed to President Yuan Shi-Kai on Jan. 18, 1915, by the Japanese minister at Peking, M. Hioki.

GROUP I. The Japanese Government and the Chinese Government, being desirous to maintain the general peace in the Far East and to strengthen the relations of amity and good neighbourhood existing between the two countries, agree to the following articles:—(1) The Chinese Government engages to give full assent to all matters that the Japanese Government may hereafter agree with the German Government respecting the disposition of all the rights, interests and concessions, which, in virtue of treaties or otherwise, Germany possesses *vis-à-vis* China in relation to the Province of Shantung. (2) The Chinese Government engages that, within the Province of Shantung or along its coast, no territory or island will be ceded or leased to any other Power, under any pretext whatever. (3) The Chinese Government agrees to Japan's building a railway connecting Chefoo or Lungkow with the Kiaochow-Tsinan Railway. (4) The Chinese Government engages to open of its own accord, as soon as possible, certain important cities and towns in the Province of Shantung for residence and commerce of foreigners. The places to be so opened shall be decided upon in a separate agreement.

GROUP II. The Japanese Government and the Chinese Government, in view of the fact that the Chinese Government has always recognized the predominant position of Japan in South Manchuria and Eastern Inner Mongolia, agree to the following articles:—(1) The two contracting parties mutually agree that the term of the lease of Port Arthur and Dairen and the term respecting the South Manchuria Railway and the Antung-Mukden Railway shall be extended to a further period of 99 years respectively. (2) Japanese subjects shall be permitted in South Manchuria and Eastern Inner Mongolia to lease or own land required either for erecting buildings for various commercial and industrial purposes or for farming. (3) Japanese subjects shall have the right to enter, reside and travel in South Manchuria and Eastern Inner Mongolia, and to carry on business of various kinds,—commercial, industrial, and otherwise. (4) The Chinese Government grants to Japanese subjects the right of mining in South Manchuria and Eastern Inner Mongolia. As regards the mines to be worked, they shall be decided upon in a separate agreement. (5) The Chinese Government agrees that the consent of the Japanese Government shall be obtained in advance (a) whenever it is proposed to grant to other nationals the right of constructing a railway or to obtain from other nationals the supply of funds for constructing a railway in South Manchuria and Eastern Mongolia; and (b) whenever a loan is to be made to any other Power, under security of the taxes of South Manchuria and Eastern Inner Mongolia. (6) The Chinese Government engages that whenever the Chinese Government needs the service of financial or military advisers or instructors in South Manchuria or in Eastern Inner Mongolia, Japan shall be first consulted. (7) The Chinese Government agrees that the control and management of the Kirin-Chanchun Railway shall be handed over to Japan for a term of 99 years dating from the signing of this Treaty.

GROUP III. The Japanese Government and the Chinese Government, having regard for the close relations existing between Japanese capitals and the Han-Yeh-Ping Company and desiring to promote the common interests of the two nations, agree to the following articles:—(1) The two contracting parties mutually agree that when the opportune moment arrives the Han-Yeh-Ping Company shall be made a joint concern of the two nations, and that, without the consent of the Japanese Government, the Chinese Government shall not dispose of or permit the Company to dispose of any right or property of the Company. (2) The Chinese Government engages that, as a necessary measure for the protection of the vested interests of Japanese capitalists, no mines in the neighborhood of those owned by the Han-Yeh-Ping Company shall be permitted, without the consent of the said Company, to be worked by anyone other than the said Company; and further that whenever it is proposed to take any other measure which may likely affect the interests of the said Company directly or indirectly, the consent of the said Company shall first be obtained.

GROUP IV. The Japanese Government and the Chinese Government, with the object of effectively preserving the territorial integrity of China, agree to the following article:—The Chinese Government engages not to cede or lease to any other Power any harbor or bay on or any island along the coast of China.

GROUP V. (1) The Chinese Government to engage influential Japanese as political, financial and military advisers. (2) The Chinese Government to grant the Japanese hospitals, temples and schools in the interior of China the right to own land. (3) In the face of many police disputes which have hitherto arisen between Japan and China, causing no little annoyance, the police in localities (in China) where such arrangements are necessary to be placed under joint Japanese and Chinese administration, or Japanese to be employed in police offices in such localities, so as to help at the same time in the improvement of the Chinese Public Service. (4) China to obtain from Japan the supply of a certain quantity of arms, or to establish an arsenal in China under joint Japanese and Chinese management and to be supplied with experts and materials from Japan. (5) In order to promote the development of the Nanchang-Kiukiang Railway, with which Japanese capitalists are so closely identified, and with due regard to the negotiations which have for years been pending between Japan and China in relation to the railway question in South China, China to agree to give Japan the right of constructing a railway to connect Wuchang with the Nanchang-Kiukiang line, and also the railways between Nanchang and Hangchow and between Nanchang and Chaochow. (6) In view of the relations between the Province of Fukien and Formosa and of the agreement respecting the non-alienation of that province, Japan to be consulted first whenever foreign capital is needed in connection with the railways, mines, and harbor works (including dockyards) in the Province of Fukien. (7) China to grant to Japanese subjects the right of religious propaganda in China.

In short, Group I of the Japanese demands would secure Japan's predominance in the Shantung peninsula, formerly under German influence, without committing Japan to the surrender of Kiaochow, which she had conquered from the Germans (see YEAR BOOK, 1914). Group II would assure to Japan valuable mining, commercial, and railway rights in the regions of South Manchuria and Eastern Inner Mongolia. Group III would safeguard the interests of Japanese capitalists in the Han-Yeh-Ping Mining Company. Group IV would exclude other powers from the Chinese coast. Group V would not only secure Japanese financial control of the Chinese province of Fukien, just opposite Formosa, and a railway concession in Southern China, but would also give Japan a very considerable influence over the general military, police, and financial affairs of the Chinese Empire.

CHINO-JAPANESE NEGOTIATIONS. Following the presentation of the Japanese demands there ensued a protracted series of conferences between the Japanese minister to China and the Chinese minister of foreign affairs. At the conference of February 12, the Chinese government announced its readiness to accept the first Group of the Japanese demands, relating to Shantung, provided that Japan would unconditionally return Kiaochow to China, indemnify Chinese citizens who had suffered by the Japanese operations against Tsingtao, withdraw the Japanese forces remaining outside of the leased territory, and give China a voice when the peace negotiations between Japan and Germany should take place. As regards Group II, subsequent negotiations made it clear that China was willing to grant Japan special privileges in the provinces of South Manchuria and Eastern Inner Mongolia, if Chinese sovereignty over those regions were specifically recognized, and if the second, third, and fourth clauses of the Group were considerably modified, so that more towns would be thrown open to international trade, but complete extraterritorial rights would not be extended to Japanese nationals. The Chinese government was willing to make voluntary assurances, but not to alien-

ate its sovereignty by giving irrevocable assent to Group IV, excluding other Powers from concessions on the Chinese coast. The second clause of Group III seemed altogether too extravagant. And some of the clauses of Group V were incompatible with the sovereignty of China. In response to the representations of the Chinese minister, Japan revised her demands and submitted a new draft, containing 24 clauses, much more moderate in tone than the original document, and omitting the demand for partial control of the police. According to the Japanese version of the negotiations, Japan at this time renewed her offer to restore Kiao-chow to China if the demands were accepted. To this revised list, the Chinese government replied with a counter-project. This failed to meet the wishes of the Japanese government in three respects: (1) China still insisted upon the unconditional return of Kiao-chow, with damages for Chinese losses, and representation in the diplomatic negotiations with Germany in respect of the leased territory; (2) China introduced a number of minor amendments in the clauses of Group II relating to Japanese privileges in Manchuria and Mongolia; (3) China refused to bind herself formally by the clauses of Group V pertaining to railway concessions in South China, the employment of Japanese advisers, the right of Japanese subjects to buy or lease land in China for the erection of schools and hospitals, and the purchase of arms from Japan. The clause of Group V relating to Fukien had already been agreed to, while the clause relating to the right of religious propaganda had been deferred and the provision for joint police administration withdrawn by Japan. The reason for China's obstinacy in refusing the fifth Group was explained in a memorandum accompanying the Chinese counter-project as arising from the fact that demands in the fifth Group "all infringe China's sovereignty, the treaty rights of other Powers, or the principle of equal opportunity." Without further parley, Japan now delivered an ultimatum, May 7, allowing the Chinese government two days to accept Groups I, II, III, IV, and the Fukien article of Group V. In event of a refusal, the Japanese government would take such action as it deemed necessary. It is important to note that the conditional offer to restore Kiao-chow to China was repeated, and that the major demands of Group V, which would have made China subservient to Japan in political and military as well as in economic affairs, were now dropped. Thoroughly intimidated by the vague threat of the Japanese ultimatum, the Chinese government on May 8 accepted Groups I, II, III, IV, and the Fukien article of Group V, completely complying with the ultimatum. The articles thus agreed upon were incorporated in two treaties and a series of notes, dated May 25, at Peking—a treaty respecting the province of Shantung (permitting Japan to agree with Germany upon the transfer of German privileges in Shantung to Japan); an exchange of notes whereby China promised never to alienate any territory on or near the coast of Shantung; a treaty respecting South Manchuria and Eastern Inner Mongolia (giving Japanese nationals a free hand in the economic exploitation of those regions, and extending the leases of Port Arthur and Dairen, the South Manchurian Rail-

way, and the Antung-Mukden Railway, until 1997, 1997, 2002, and 2007 A.D., respectively); a series of notes defining the status of Japanese subjects in the above-mentioned provinces in respect of Chinese courts and taxes, specifying the districts in which Japanese capitalists would be allowed to select coal, iron, and gold mines for exploitation, and promising to give Japanese capital and Japanese advisers the preference in those provinces; an exchange of notes safeguarding the control of the Han-Yeh-Ping Company by Japanese capitalists; an exchange of notes declaring that China had no intention to permit any foreign power to construct a shipyard, coaling station, naval base, or other military establishment, on the coast of Fukien, or to construct such establishments herself with foreign capital; and, finally, an exchange of notes whereby Japan promised with certain provisos to return the leased territory of Kiao-chow to China, "if, upon the conclusion of the present war, the Japanese government should be given an absolutely free disposal of the leased territory of Kiao-chow Bay."

POLITICAL AFFAIRS. Late in January the Far Eastern Bureau made the announcement that Lu Cheng-Hsiang, China's ablest diplomat, had been appointed minister of foreign affairs to succeed Sun Pao-Chi who became head of the Audit Department of the government. In April President Yuan Shi Kai accused Dr. Sun Yat-sen of plotting a new revolution against the government. Dr. Sun Yat-sen had been residing in Tokio since his last unsuccessful effort to depose Yuan Shi Kai. It was rumored unofficially that Japan was backing the revolutionary efforts of the former president of the Chinese Republic. Dr. Frank J. Goodnow, president of Johns Hopkins University, was appointed constitutional adviser to the government by President Yuan early in June. Two weeks later the president of the republic unearthed an amount of peculation and petty graft among government officials, with the result that Chang-Hu, vice-minister of finance, and Yeh Kung-Cho, vice high minister of communications, were dismissed. Chang-Hu, who had been acting as a director of the Salt Gabelle, one of the government's principal sources of revenue, was sentenced to banishment in Sze Chuen Province.

RESTORATION OF THE MONARCHY. The trend of the Chinese government to revert to absolutism in the hands of Yuan Shi Kai became more pronounced in the summer of 1915. Rumors were frequent that Yuan Shi Kai was contemplating a *coup d'état* for the restoration of the Empire, with himself as Emperor. The progress of the monarchist reaction, it was alleged, caused the resignation of Vice-President Li Yuan Heng, September 2nd. A little later, the Society for the Preservation of Peace presented a petition to the Advisory Council calling for the reestablishment of the monarchy. The first week in October the Council of State, acting as a provisional parliament, enacted a bill convoking a citizen's representative congress to decide the question whether or not the republic should be abandoned. Accordingly elections were held in November. So overwhelming a majority of the popular vote was cast in favor of monarchist candidates that the Council of State in December urged Yuan Shi Kai to declare himself emperor. The President

hesitated. He had repeatedly declared himself in favor of maintaining the republic, and he was reported to have received advice from Japan, Russia, and Great Britain pointing out that it would be wise to avoid any radical alteration of the Chinese constitution, lest disturbances should occur. The warning against a restoration of the monarchy was repeated December 15th by the diplomatic representatives of Japan and the Quadruple Entente in Peking. Nevertheless, Yuan announced that it was no longer possible to disregard the will of the nation, as expressed by the Council of State and as manifested by the elections; therefore he considered it his duty to consent to the restoration of the Empire. The formal changes that would be necessary in the administrative machinery, and the coronation ceremony, however, were to be delayed at least until the close of the year 1915, in accordance with the assurances which had been given to the Entente Powers. It was to be expected that the restoration of the Empire would encounter the most stubborn opposition from the convinced republican leaders who had fought for the establishment of the republic in 1911-12 (see *YEAR BOOKS* 1911, 1912, CHINA). A republican insurrection was confidently predicted by many students of Chinese politics. Reports of a mutiny on board the Chinese cruiser *Chao-ho* in Shanghai harbor, seemed at first to fulfill the prophecy, but presently it appeared that the "mutiny" was merely the escapade of a handful of revolutionaries who seized the ship and opened fire on neighboring vessels. The "mutiny" was easily suppressed and seemed to be quickly forgotten. More serious, however, were the reports which began to appear at the close of December, alleging that two of the southernmost provinces, Yunnan and Kwangsi, had seceded and were in the hands of the rebel General Tsai-To, who had played a conspicuous part in the revolutionary movement of 1911.

RELATIONS WITH THE UNITED STATES. Chinese relations with the United States were improved greatly during the year. The European war took away China's market for products, with the result that she appealed to the United States in many different connections. The first important effect took place on January 13th, when China shipped \$1,700,000 in gold to San Francisco. This money was not necessarily for goods purchased in America, but to represent a debit balance on the transactions in which China was interested in different parts of the world. As the gold would ordinarily have been sent to London, the shipment to San Francisco, and thence to New York, was a noteworthy event in the development of the United States as a financial centre. This shipment was followed later by two of smaller amount. American consuls in China at various times reported increases in the sale of American-made goods in different Chinese provinces. A most important development in trade relations with the United States was the decision to send a trade commission to that country. Many of the highest officials and most prominent Chinese merchants were formed as a result of the commission; they arrived in the United States in May, and spent two months inspecting industrial plants all over the country. Nearly 200 plants were visited during this period. Much closer relations between Chinese and American

merchants were formed as a result of the commission's visit. In many plants which were visited the Chinese commissioners were so favorably impressed that they gave immediate orders for purchases.

The United States took little action in regard to the demands which Japan made on China in January. On February 27th two unofficial representatives of the United States in Japan—Dr. Sidney Gulick and Prof. Shailer Matthews—visited Count Okuma, Japanese Premier, and were informed by the latter that Japan had no intentions of trespassing on China's rights or the privileges of other nations in the country. Late in March President Wilson branded as false the Japanese rumor that the United States approved of the demands on China. As no answer had as yet been received from Japan, it was impossible, said the President, either to approve or disapprove of the demands. A few days later the United States government protested to Japan against her interference in the selection of foreign advisers, the purchase of war munitions, and the contraction of foreign loans. On May 6th the government issued a statement to the effect that it had been advised that Japan had no intention of interfering with the political independence or territorial integrity of China or with the "open-door" policy to which all of the leading nations were committed. Furthermore, the United States government had not been asked to surrender any of its treaty rights in China, and did not intend to do so if asked. One week after the treaty had been agreed upon by the two Powers, the United States, as a precautionary measure, sent each a note to the effect that it could not agree to any action which might impair the treaty obligations contracted by the United States and China, the "open-door" policy, or the integrity of the Chinese Republic. On July 26th, Dr. V. K. Wellington Koo was appointed Chinese minister to Mexico, Peru, and Cuba. Dr. Koo, after graduating from Columbia University, had been selected by President Yuan Shi Kai as official secretary, and had been of valuable assistance to the Chinese foreign minister in the conduct of the negotiations with Japan in the spring of 1915. Three months after his appointment as minister to Mexico, Peru, and Cuba had been announced, Dr. Koo was named as Chinese minister to the United States, succeeding Kai Fu Shah, who had been recalled. Because of his fluent command of the English language, and his American education, Dr. Koo was particularly well qualified to represent the Chinese government at Washington. In August the Chinese government sent a naval commission to the United States, headed by Admiral Wei Han, chief of Chinese naval construction, for the purpose of studying American naval equipment, navy yards, and submarines. A newspaper report, probably unfounded, later announced that the commission had arranged to purchase from an American firm no fewer than 100 submarines, at a total cost of \$75,000,000, for the enlargement of the Chinese navy.

CHOLERA. An epidemic of this disease occurred in Manila in 1914, a record of which was published in April, 1915. Two features of the treatment are worth recording. In all there were 1100 cases, including suspects and carriers; 330 were genuine cases of cholera, 170

not cholera, and 570 were carriers. The total number of deaths with and without medical treatment was 190. The percentage of recoveries among the 330 genuine cases treated at San Lazaro was 72.5. It was observed that nearly all patients slept with their eyes partly open, the eye-balls rotated upward, the lids parted, and two-thirds of the pupil frequently visible. This symptom was invariably present among the children, and was considered of diagnostic importance. In the treatment, a solution of 0.45 per cent sodium chloride, 0.25 per cent sodium bicarbonate, was injected into a vein at the rate of about 1 litre in 45 minutes. The injection acted as a mild hypnotic and made good the loss of fluid through the watery bowel movements. Another measure which appeared to give equally good results was continuous proctoclysis. The slow, steady introduction of warm saline fluid into the rectum caused the pulse to return to normal in from 8 to 10 hours. Proctoclysis was particularly serviceable in cases of *cholera sicca*. These patients generally died, in spite of intravenous saline injections when used alone; but when the intestine was emptied by a copious enema, and this followed by proctoclysis, signs of recovery often began to appear in about an hour. Under the treatment outlined, the application of artificial heat, the administration of sedatives and cardiac stimulants were rarely found necessary.

In controlling the epidemic the Bureau of Health confined its efforts largely to detecting and isolating vibrio carriers. All the members of the family of a cholera suspect were immediately examined, and those found to harbor cholera vibrios were promptly quarantined. In all, 570 persons were isolated. They were confined to the hospital until at least two negative stools were obtained on separate days. The carriers received saline cathartics, followed by salol.

Active immunization against cholera was undertaken by the bacteriologic institution at Budapest, which distributed free serum for the purpose. The serum is described as being prepared from a fresh culture of the cholera bacillus, a bacterial emulsion being made with physiologic salt solution in the proportion of 2 mg. of bacteria to 1 c.c. of salt solution. The fluid is exposed to a temperature of 132.8°F. for one hour in order to kill the bacteria, and 0.5 per cent phenol is added for preservation. The substance is really not a serum, but a vaccine. Those exposed to infection, such as hospital attendants, are advised to have two injections five days apart, which confers immunity lasting from a few months to a year. A reaction of greater or lesser intensity is observed during 48 hours following the injection. See also INSECTS, PROPAGATION OF DISEASE BY, and VITAL STATISTICS.

CHORAL SOCIETIES. See MUSIC.

CHOSEN. See KOREA.

CHRISTIAN ENDEAVOR, UNITED SOCIETY OF. The 27th international convention of the society was held in Chicago, July 7-12, 1915. The convention was one of the most successful and significant held in its history. Thursday, July 8, was State day, and was observed by speeches from representatives of the work in the different States. Special attention was given during the convention to the subjects of tem-

perance, missions, and internationalism. Denominational rallies were held in the leading churches in the various denominations in Chicago. The society numbers 4,000,000 members, 75,000 different societies, and includes 80 denominations.

CHRISTIANS. The total number of communicants in this denomination in 1914 was 113,887. There were 1360 churches, and 1086 ministers. The administrative body of the church is the American Christian Convention, which is made up mostly of delegates from the conferences. This, of course, has the general supervision of the work of the denomination. Several schools and colleges are maintained, the most important of which are the Union Christian College in Indiana, Defiance College in Ohio, Starkey Seminary in New York, Elon College and Franklinton Christian College (colored) in North Carolina, Palmer College and Weaubleau College in Missouri, and Jireh College in Wyoming. It has also a theological school, the Christian Biblical Institute, in Ohio. Missions are conducted in Japan, Porto Rico, continental United States, and Canada.

CHRISTIAN SCIENCE. During the year 1915 the administration of the trust created by the terms of the will of Mary Baker Eddy was continued. In 1914 the trustees, Archibald McLellan, Allison V. Stewart, John V. Dittmore, Adam H. Dickey, and James A. Neal—directors of the First Church of Christ Scientist in Boston—and Josiah E. Fernald, of Concord, N. H., announced their plan for using the income of Mary Baker Eddy's estate for the purpose stated in her will. This purpose was the "more effectually promoting and extending the religion of Christian Science as taught by her." The plan, as announced at the annual meeting of the Mother Church on June 8, 1914, was as follows: 1. To contribute toward the expense of lectures given by Christian Science organizations outside the United States, Canada, and Great Britain. 2. To contribute toward the ever-increasing distribution of authorized literature throughout the world. 3. To contribute toward the establishment and maintenance of circulating or lending libraries of authorized Christian Science literature in connection with the denomination's churches, societies, reading-rooms, and Sunday schools. 4. To assist, in so far as is possible and practicable, in building church edifices.

The plan thus formulated was carried into effect in 1914 and with increased vigor and efficiency in 1915. A large sum of money, amounting to about \$250,000 thus far, was distributed for the benefit of Christian Scientists and others affected by the war in Europe. In response to an appeal from the Mother Church, nearly all branch churches and societies, as well as individuals, contributed liberally to the war relief fund. An official representative of Christian Science from Boston visited the countries at war, found where the needs were greatest, and appointed representatives to distribute funds. The distribution of literature was continued; and up to June 1, 1915, the number of magazines, journals, pamphlets, and other pieces of literature in five languages (English, French, German, Swedish, and Norwegian) amounted to over 600,000.

The Board of Directors of the Mother Church decided in June, 1915, to accept the plans for a memorial to Mary Baker Eddy in Mount Auburn

Cemetery in Cambridge, Mass. The designer of the memorial is Egerton Swartout, of New York City. The plot is 80 feet square, and the memorial consists of a circular open colonnade of eight columns, resting upon a stylobate of three steps, surrounded on the front by a circular platform slightly above the natural grade, from which platform a double flight of steps leads to a lower platform at a lake's edge. The scheme is a screen of columns open to the sky, enclosing a flower-grown circle. The material is white granite, the inscription of white bronze, and the detail is entirely floral in form and free in treatment, the wild rose and the morning-glory being used as the main motives. The extreme width of the memorial is 80 feet, colonnade 18 feet in diameter, and columns 15 feet in height.

During 1915 the Christian Science movement, in number of adherents, number of churches, and in every respect, showed a steady and progressive development.

CHURCH BUILDING. See ARCHITECTURE.

CHURCHILL, WINSTON. See LITERATURE, ENGLISH AND AMERICAN, *Fiction*.

CHURCHILL, WINSTON LEONARD SPENCER. See GREAT BRITAIN, *History, passim*.

CHURCH OF ENGLAND. See ENGLAND, CHURCH OF.

CHURCH OF GOD, THE. See ADVENTISTS.

CHURCH OF GOD IN JESUS CHRIST, THE. See ADVENTISTS.

CHURCH STATISTICS. See RELIGIOUS DENOMINATIONS.

CIGARS AND CIGARETTES. See TOBACCO.

CITRUS FRUITS. See HORTICULTURE.

CITY CHARTERS. See MUNICIPAL GOVERNMENT.

CITY GOVERNMENT. See MUNICIPAL GOVERNMENT.

CITY-MANAGER PLAN. See MUNICIPAL GOVERNMENT.

CITY PLANNING. Just how the events of the year 1915 on the battlefields of Europe will ultimately affect city planning in England or on the Continent it would be vain to attempt to predict. For the time both the planning and execution of all sorts of municipal improvements except those connected with military operations seemed to have come nearly to a stop. In Canada there was a similar pause, but the work of Thomas Adams, City Planning Adviser to the Canadian Conservation Commission, was continued. In the United States there was also a check to city planning, but projects already under execution, like the group plan of the public buildings at Cleveland, Ohio, went forward.

At the seventh National Conference on City Planning, held at Detroit in June, 1915, Flavel Shurtleff, secretary, called attention to the fact that the dominant note in American city planning literature prior to 1909, was æsthetic, while at the first Conference, held that same year, the "æsthetic note" was "almost absent," stress having been "put on planning as an economic remedy for municipal waste and for social misery." At subsequent conferences the economic and social sides of the subject were also dominant. In the 1915 Conference considerable attention was paid to the architectural phases of city planning, but the one subject which was given most attention at the Detroit meeting was land subdivision, or the

size and arrangement of blocks and lots. Papers and discussions on this subject occupy about 90 pages of the report of the 1915 Conference. A notable feature of the discussion on subdivision was the part taken in it by real estate men.

Another feature of the 1915 Conference was a report of a committee on the Constitution and Powers of a City Planning Authority, consisting of a summary of replies to a *questionnaire*. A single city planning authority or office for each city was favored by 79 of 80 replies. Of 76 replies to a second question, 45 favored making the creation of a city planning authority mandatory, and 2 favored it if the authority had advisory powers only; 25 favored the permissive method, and 4 believed in this method at first, with the mandatory method eventually. A third question dealt with the powers that should be given a city planning authority to correlate particular improvements with the comprehensive city plan. Of 74 who replied, 9 favored advisory powers; 7 an absolute veto; 28 a veto that could be overridden by the city council; and 30 some combination of the methods named. A great diversity of opinion was shown as to the proper constitution of a city planning authority. A total of 71 opinions were expressed. Of these 28 favored a special unpaid commission of citizens, not city officials; 3 were for a committee of the council; 2 advocated an ex-officio commission of department heads or engineers; 2 favored the city engineer; and 36 favored a combination of the four methods. As to the advisability of vesting local authorities with powers like those in the English Town Planning and Housing Act of 1909, 55 answered yes, and 4 no. State legislation compelling or permitting city planning commissions has been enacted in Massachusetts, Connecticut, New York, New Jersey, Pennsylvania, Maryland, Ohio, Wisconsin, Nebraska, and California, and about 100 commissions have been appointed. The first of these commissions was created in Hartford, Conn., in 1908.

Excess condemnation, or the taking of more land than is needed for a public improvement with power to combine, subdivide, and sell the excess, is considered by many as essential to city planning, both for the purpose of controlling abutting or facing property, and of enabling the city to reap a part of the enhancement of the value of property surrounding the improvement, thus reducing the cost of the improvement. The apparent success of this practice abroad led to its advocacy in the United States. Legislation authorizing excess condemnation was enacted by Massachusetts and Ohio in 1904, Virginia in 1906, Connecticut and Pennsylvania in 1907, and Maryland in 1908. A Philadelphia purchase under the 1907 act was declared unconstitutional by the State Supreme Court the same year. Constitutional sanction for excess condemnation was secured in Massachusetts in 1911, Wisconsin and Ohio in 1912, and New York in 1913. It was defeated by popular vote in New Jersey and California in October, 1915. To the middle of the year no use of this constitutional power had been reported, but New York City had just perfected a plan for putting excess condemnation into effect.

Courses in city planning are now offered at Harvard University, the University of Illinois,

and perhaps elsewhere in the United States, and at the University of Liverpool in England. During the year members of the classes in civic design at the University of Illinois, working under the direction of Prof. Charles M. Robinson, made, and the university published, *A Study in City Planning in Champaign and Urbana*. The National Conference on City Planning (Boston, Mass.) established a small *City Plan Quarterly* in 1915. Recent British books are Patrick Geddes, *Cities in Evolution* (London); Henry Aldridge, *The Case for Town Planning* (National Town Planning and Housing Council). At the close of the year a new American book was announced: Nolen, *City Planning* (New York). See MUNICIPAL GOVERNMENT, under *Model City Charter*.

CIVIC ASSOCIATION, AMERICAN. No annual meeting of this association was held during 1915, but it was postponed until the early part of January, 1916. The work of the association during the year progressed as usual, the war having had but little influence upon it. The general headquarters of the association are at Washington. The officers are: J. Horace McFarland, president; William B. Howland, treasurer; Richard B. Watrous, secretary.

CIVIC CENTRES. See CITY PLANNING.

CIVIC FEDERATION, NATIONAL. The usual annual meeting was not held in 1915, partly owing to the war, and partly to the unusual number of topics which demanded attention. The meeting annually held in December of each year was therefore postponed for over a month, and no annual report was made during 1915. Among the subjects which were vigorously discussed during the year especial emphasis was given to the legal and moral obligations resting upon foreign-born citizens of the United States—those who have become, and those who have taken steps to become, naturalized citizens. Attention was also given to the duties and prospects of those who are engaged in labor and business in the United States, but who do not intend to take out citizens' papers. The remarkable check imposed by the war upon immigration led to a careful inquiry concerning its economic results, its effect upon the wage-earner, upon industry, and upon the body politic. Special committees were engaged to prepare reports upon the profit-sharing plans now in operation in the United States, as well as a description of the abandoned ones and the causes of their failure. The investigation was thorough, covering the different methods employed in industrial enterprises—manufacturing plants, mercantile houses, public service corporations, and financial institutions.

The remarkable condition of affairs in Europe, where governments have been compelled by the war to take over more and more of private industry, has had a profound effect upon thought in this country, and during the year much attention was given by members of the federation to the question as to how far government here could enter into private industry. The crux of the inquiry was whether the change in Europe was permanent, or only tolerated as a military necessity.

The industrial economics department of the federation made a survey during the year of the social and industrial changes which have taken place in the United States during the last generation. The object of the survey was

to summarize the changes in American national life, and to gather together the essential material from which to judge where there has been improvement, where loss, and how far, on the whole, gains and losses balance or outweigh one another. More particularly the survey tried to find out (1) how wages, hours of labor, and the physical conditions of the factory and the home compare with those of 30 years ago; (2) what effect the work of the American Federation of Labor, the Railway Brotherhoods, and the social reform organizations, and the legislation secured by them has had upon conditions in factories, mercantile establishments, mines, bakeries, tenement houses, and sweat shops; (3) whether child labor has increased or diminished in recent decades; (4) what effect State legislation has had upon age limits, hours worked, and opportunity for education; (5) the effect of the adoption of the principle that industry shall bear the burden of industrial accidents; (6) what has been done by employers for the physical well-being of wage-earners; (7) whether the farmer is holding to the ownership of his farm, lapsing into tenancy, or sinking under mortgage debt; (8) the housing conditions, educational opportunities, public health, business ethics, political ethics.

The officers of the federation are: president, Seth Low; vice-presidents, Samuel Gompers and Benjamin Ide Wheeler; treasurer, Isaac N. Seligman; chairman of the executive council, Ralph M. Easley.

CIVIL SERVICE. FEDERAL CIVIL SERVICE. The total positions held in the civil service of the United States on June 30, 1915, were 454,116. Of these 9692 were presidential appointments. In addition to this total, 28,605 were employed on the Panama Canal, making a grand total of 482,721. There were employed in the City of Washington 33,464 persons in the civil service, and outside, 420,652. There were no noteworthy developments in the history of the Federal Civil Service during 1915. The National Civil Service Reform League began an energetic campaign with the special purpose of securing legislation providing for the competitive classification of first, second, and third class postmasters. Improvement in the administration of the foreign service was promised by the passage of the so-called Stone-Flood Bill in the 63rd Congress. This bill provided for the classification of the diplomatic secretaries and consular officers in the grades, and the assignments of the members of this service from these grades. The President was also authorized to transfer these officers from post to post as the interests of the service might require. The Secretary of State was required to keep a service record of the officers of the foreign service, and to report to the President the names of those who especially deserved promotion.

THE STATE CIVIL SERVICE. The State Legislatures did not enact many important civil service measures in 1915. There appeared to be in general a reaction against social legislation, and this was accompanied by a similar reaction in regard to civil service laws. The Legislature of Colorado enacted a new law, the effect of which will be largely to defeat the purpose of the merit system. In Wisconsin an effort was made to weaken the merit system by the passage of a bill permitting the certification

of an entire eligible list, instead of three names. The civil service law was also weakened by the Ohio Legislature. In California the Legislature approved a bill which would take from the Civil Service Commission its power of investigation. This was vetoed by Governor Johnson. In contrast to these efforts to destroy the value of civil service measures, the Legislature of Kansas passed a civil service bill applying to the State service. Similar measures were passed in New Jersey and in Louisiana.

CIVIL SERVICE COMMISSION. See CIVIL SERVICE.

CIVIL SERVICE REFORM LEAGUE, NATIONAL. The 35th annual meeting of the league was held at Philadelphia, Dec. 2, 1915, the address being delivered by the president, Richard H. Dana, who reviewed the league's progress during the year. The council reported the steady growth of public sentiment in favor of the merit and efficiency system, but sharply criticized the Republican legislatures in Connecticut and Colorado for attacks made upon the system in those States, while it praised the Republican legislature in New Jersey for upholding the system. In several other State legislatures, including Wisconsin, Ohio, and California, attempts prejudicial to civil service reform were made, but were not successful. In Kansas, Louisiana, and New York, substantial progress was made; but in Chicago a bitter struggle during six months went on between civil service reform supporters and the Mayor, with the result of substantial injury to the cause by the capture of a large number of offices for the benefit of the Mayor's following. In New York State Governor Whitman secured the resignations of the Sulzer-Glynn Commissioners, and vetoed bills which sought to weaken the effect of civil service reform, and the commission appointed by the Governor did much to restore the merit system and its personnel in the State. In New York City, the commission appointed by Mayor Mitchell made notable advances in methods of civil service examinations, filling by competitive non-assembled examinations high-grade positions to which hitherto the competitive classification had not applied. The governing board of the league resolved to start an active campaign to secure the competitive classification of all postmasters. The officers of the league are: president, Richard Henry Dana; chairman of the council, Robert D. Jenks; secretary, George T. Keyes; assistant secretary, Harry W. Marsh; treasurer, A. S. Frissell.

CLARK, CHARLES HEBER. American writer, died Aug. 10, 1915. He was better known under the pen name of "Max Adeler." Born in Berlin, Md., in 1841, he was educated at Georgetown, D. C.; entered journalism in 1865; and engaged in writing for many years. He was at one time one of the most widely read humorous story-writers in the United States, but his later years were devoted chiefly to economic and industrial subjects. He was editor of the *Textile World*, and was engaged in manufacturing at Conshohocken, Pa. His writings include: *Out of the Hurly Burly*; *Captain Bullett*; *In Happy Hallow*; and *The Quakers*.

CLARK COLLEGE. An institution for higher education at Worcester, Mass. Although the same buildings are used for both Clark Uni-

versity and Clark College, the latter is entirely independent in administration and endowment. There were in the different departments of the institution in the autumn of 1915, 171 students, and a faculty numbering 27. Clark College is non-sectarian. The productive funds of the college amounted to \$1,400,000 and the income to about \$70,000. The library contains 75,000 volumes. The president of the college is Edmund C. Sanford, Ph.D.

CLARK UNIVERSITY. An institution for graduate study, founded at Worcester, Mass., in 1889. The total enrollment in all departments in the autumn of 1915 was 107. The faculty numbered 21. There were no notable changes in the membership of the faculty during the year, and no noteworthy benefactions were received. The productive funds of the university amounted to about \$2,400,000, and of the college to \$1,400,000. The library contains about 65,000 volumes. The president of the university is G. Stanley Hall, Ph.D., LL.D.

CLASSICAL LITERATURE AND SCHOLARSHIP. See PHILOLOGY, CLASSICAL.

CLAY WORKING INDUSTRIES. The clay working industries were not especially prosperous in 1914. The total value of all clay productions marketed was \$164,986,983, compared with a value of \$181,289,132 in 1913, a decrease of nearly 9 per cent. This decrease was due chiefly to the general condition of business. Of the two great divisions of the industry—brick and tile, and pottery—the former showed the larger decrease. The decrease in the brick and tile industry was 9½ per cent, and in the pottery industry about 7 per cent. The most prominent features in the industry were the continued large decrease in the production and value of common brick in the regions supplying the New York City markets, and the large increase in the value of clay pottery in Iowa, Minnesota, Oklahoma, Maine, and West Virginia. There was a decrease in 37 States in the development of clay pottery in 1914. Ohio has been the leading State in clay potteries since statistics were first compiled in 1894; Pennsylvania ranks second; New Jersey third; Illinois fourth; New York fifth; and Indiana sixth. Common brick is the most widely distributed. Illinois was the largest producer. Next to the common brick, front or face brick has the widest distribution. The value of all the States in pottery in 1914 was \$35,395,161. Every product, except red earthenware, decreased in value in 1914. The number of States producing pottery of some variety was 37. There are several States in which pottery of higher grades are made. White ware is made in eight States; china in four; and porcelain and electrical supplies in nine States. Ohio is the leading State in pottery, Pennsylvania second, and Missouri third. New Jersey is the leading china-producing State, with New York second, Pennsylvania third, and West Virginia next. Ohio produces every variety of pottery, except china. The principal pottery production in New Jersey is sanitary ware. The pottery imports in the United States in 1914 were valued at \$8,349,442. The exports were valued at \$3,578,005.

CLEARING HOUSE. See FINANCIAL REVIEW.

CLEARING SYSTEM. See BANKS AND BANKING, *Federal Reserve Clearing System*.

CLIMATE IN THE UNITED STATES.

See METEOROLOGY.

CLOTHING INDUSTRY, NEW YORK. See ARBITRATION AND CONCILIATION, *New York Clothing Industry*.

CLOUSTON, SIR THOMAS SMITH. English physician, died April 20, 1915. He was born in Orkney in 1840; educated in Aberdeen and Edinburgh universities; and became successively physician for the Cumberland and Westmoreland Asylum, physician superintendent of the Royal Asylum, Morningside, Edinburgh, and lecturer on mental diseases at Edinburgh University. He received the degree of LL.D. from Aberdeen and Edinburgh universities, and was knighted in 1911. From 1902-03 he was president of the Royal College of Surgeons, Edinburgh. His published writings include: *Clinical Lectures on Mental Diseases; The Hygiene of the Mind; and Unsoundness of Mind*.

CLUB BUILDINGS. See ARCHITECTURE.

COAGULEN CIBA. This is a hemostatic drug said to be an extract prepared from blood-platelets and to contain a thromboplastic substance, mixed with lactose, 1 gm. representing 20 gm. of dried blood. Coagulen is said to act as a hemostatic by increasing the natural process of clotting. In 5 per cent solution the substance may be used by local application or by injection into the muscles or veins. Coagulen ciba occurs as a yellowish, granular powder, having a sweet taste and faint odor. It is very soluble in water and such a solution may be boiled for two or three minutes without destroying its therapeutic activity.

COAL. The coal mining industry in 1915 presented a marked contrast to that of the preceding year. In 1913 the production of both anthracite and bituminous coal reached its highest points as recorded; in 1914 the output fell below that of 1913, and even of 1912. The production in these years was phenomenal and followed the reaction of the panic years of 1907 and 1908. The decrease in production in 1914 was due partly to the depression of the iron trade in the early part of the year. After the close of the first quarter of 1914, the call for bituminous coal decreased, and during the last quarter the conditions in many of the coal mining regions were little short of demoralized. The European war does not seem to have exerted a marked effect upon the production of coal in the United States in 1914. Certain Rocky Mountain fields suffered a decrease as a result of the curtailment of copper smelting after the war began. There were two important strikes during the year, one in Colorado, and one in Ohio. But the effect of these was not so serious as it would have been in a year when the demand for coal was strong.

In view of the general depression, and the lighter demand for coal, the firmness of prices in 1914 was noticeable.

The total production of coal in 1914 was 513,525,477 short tons, valued at \$681,490,643. The decrease from 1913 in the production amounted to 569,960,219 tons, or nearly 10 per cent. Of the total amount of the coal produced, 81,900,631 long tons were Pennsylvania anthracite, and 422,703,970 short tons were bituminous coal and lignite. The production of anthracite in 1913 was 81,718,680 long tons, while the production of bituminous in the same year was 478,435,297 short tons. The decreased production in anthracite

was due particularly to mild weather during the winter months in the area where it is used almost exclusively, and to the decreased exportation to Canada. The decrease in the demand for bituminous coal was distributed generally all over the country, with the exception of seven States where the production in 1914 was greater than in 1913. Two of these States indicated, South Dakota and North Dakota, produced lignite only, and had relatively small outputs. The increase in New Mexico was due to ability to supply markets ordinarily furnished by coal from Colorado, which, in 1914, suffered from a serious strike. The other States which showed increase were West Virginia, Kentucky, Michigan, and Oregon. The greatest decrease was in Pennsylvania, which fell off almost 26,000,000 tons, or nearly 15 per cent. In Ohio the decrease was nearly 50 per cent, compared with 1912. This is accounted for by strike conditions.

Several changes took place in the rank of coal producing States in 1914, the most notable of which was the supplanting of Ohio by Kentucky as fourth in quantity of output. From 1896 to 1913 Ohio occupied fourth place. The change is due to decreased production on account of strike conditions in this State. Indiana succeeded Alabama in sixth place, and Wyoming in eleventh place. Washington dropped from seventeenth to nineteenth in output, and from twelfth to fifteenth in value. The value of the coal in Ohio maintained fourth place, and Alabama dropped from sixth to seventh place in quantity of output, and was sixth in point of value. Additional information in regard to the production of coal in individual States may be found in the paragraph, *Mineral Production*, under the separate States. The tables below give the relative rank of the coal producing States in 1913-14 with the quantity and value of production.

Rank	State	1913 Production	
		Quantity (short tons)	Per- centage of total produc- tion.
1	Pennsylvania:		
	Anthracite	91,524,922	16.1
	Bituminous	173,781,217	30.5
2	West Virginia	71,254,186	12.5
3	Illinois	61,618,744	10.8
4	Ohio	36,200,527	6.8
5	Kentucky	19,616,600	3.4
6	Alabama	17,678,522	3.1
7	Indiana	17,165,671	3.0
8	Colorado	9,232,510	1.6
9	Virginia	8,828,068	1.5
10	Iowa	7,525,936	1.3
11	Wyoming	7,393,066	1.3
12	Kansas	7,202,210	1.3
13	Tennessee	6,860,184	1.2
14	Maryland	4,779,839	.8
15	Missouri	4,318,125	.8
16	Oklahoma	4,165,770	.7
17	Washington	3,877,891	.7
18	New Mexico	3,708,306	.7
19	Utah	3,254,828	.6
20	Montana	3,240,973	.6
21	Texas	2,429,144	.4
22	Arkansas	2,234,107	.4
23	Michigan	1,231,786	.2
24	North Dakota	495,320	.1
25	Georgia	253,626	
26	Oregon	46,063	
27	California and Alaska	26,911	.1
28	South Dakota	10,540	
29	Idaho and Nevada	2,177	
Total		569,960,219	100.0

Rank	State	1913 Value	Per- centage of total value
1	Pennsylvania:		
	Anthracite	\$195,181,127	25.7
	Bituminous	193,039,806	25.4
2	West Virginia	71,822,804	9.5
3	Illinois	70,313,605	9.2
4	Ohio	39,948,058	5.3
5	Alabama	28,033,724	3.0
6	Kentucky	20,516,749	2.7
7	Indiana	19,001,881	2.5
8	Colorado	14,035,090	1.8
9	Iowa	13,496,710	1.8
10	Kansas	12,036,292	1.6
11	Wyoming	11,510,045	1.5
12	Washington	9,243,187	1.2
13	Virginia	8,952,653	1.2
14	Oklahoma	8,542,748	1.1
15	Tennessee	7,839,721	1.0
16	Missouri	7,468,308	1.0
17	Maryland	5,927,046	.8
18	Montana	5,653,539	.7
19	New Mexico	5,401,260	.7
20	Utah	5,384,127	.7
21	Texas	4,283,920	.6
22	Arkansas	3,923,701	.5
23	Michigan	2,455,227	.3
24	North Dakota	750,652	.1
25	Georgia	361,319	.1
26	Oregon	116,724	
27	California and Alaska	95,173	
28	South Dakota	20,648	
29	Idaho and Nevada	5,285	
Total		\$760,416,079	100.0

Rank	State	1914 Production Quantity (short tons)	Per- centage of total production.
1	Pennsylvania:		
	Anthracite	90,821,507	17.7
	Bituminous	147,983,294	28.8
2	West Virginia	71,707,626	14.0
3	Illinois	57,589,197	11.2
4	Kentucky	20,382,763	4.0
5	Ohio	18,843,115	4.0
6	Indiana	16,641,132	3.2
7	Alabama	15,593,422	3.0
8	Colorado	8,170,559	1.6
9	Virginia	7,959,535	1.5
10	Iowa	7,451,022	1.4
11	Kansas	6,360,988	1.3
12	Wyoming	6,475,293	1.2
13	Tennessee	5,943,258	1.2
14	Maryland	4,133,547	.8
15	Oklahoma	3,988,613	.8
16	Missouri	3,935,980	.8
17	New Mexico	3,877,689	.7
18	Utah	3,103,036	.6
19	Washington	3,064,820	.6
20	Montana	2,805,173	.5
21	Texas	2,323,773	.4
22	Arkansas	1,836,540	.3
23	Michigan	1,283,030	.2
24	North Dakota	506,685	.1
25	Georgia	166,498	.1
26	Oregon	51,568	
27	California, Idaho, and Ne- vada	13,974	
28	South Dakota	11,850	
Total		513,525,477	100.0

Rank	State	1914 Value	Per- centage of total value
1	Pennsylvania:		
	Anthracite	\$188,181,399	27.6
	Bituminous	159,006,286	23.3
2	West Virginia	71,391,408	10.5
3	Illinois	64,693,529	9.5
4	Ohio	21,250,642	3.1
5	Kentucky	20,852,463	3.0
6	Alabama	20,849,919	3.0

Rank	State	Value	Per- centage of total value
7	Indiana	18,290,928	2.7
8	Colorado	18,601,718	2.0
9	Iowa	18,364,070	2.0
10	Kansas	11,238,253	1.6
11	Wyoming	10,033,747	1.5
12	Oklahoma	8,204,015	1.2
13	Virginia	8,032,448	1.2
14	Missouri	6,802,325	1.0
15	Tennessee	6,776,573	1.0
16	Washington	6,751,511	1.0
17	New Mexico	6,230,871	.9
18	Maryland	5,234,796	.8
19	Utah	4,935,454	.7
20	Montana	4,913,191	.7
21	Texas	3,922,459	.6
22	Arkansas	3,158,168	.5
23	Michigan	2,559,786	.4
24	North Dakota	771,379	.1
25	Georgia	239,462	.1
26	Oregon	148,556	
27	California, Idaho, and Ne- vada	39,921	
28	South Dakota	20,456	
Total		\$681,490,643	100.0

In regard to the number of men employed in the coal mines, the year 1914 surpassed all others. The number employed in anthracite and bituminous mines for the first time exceeded a quarter of a million. The total number of men employed in 1914 was 703,185; of this number 179,679 were engaged in the production of anthracite, and 523,506 in the bituminous and lignite mines.

LABOR TROUBLES. The biennial wage scale agreements in the bituminous organized coal mining districts of the United States, made in 1912, expired April 1, 1914, and as usual, pending settlement of the new agreement, there were a large number of men on strike. The most serious conflict was in Ohio, where a total number of 40,577 men were affected by the strike for an average of 159 days. In other States the wage agreements were effected without serious loss of time. The coal strike was in effect from September, 1913, in Colorado, until December, 1914. Labor troubles in the anthracite regions were numerous, but not long continued.

ACCIDENTS. The record of fatal accidents in the coal mines in 1914 showed a decrease from 2785 in 1913, to 2454 in 1914. Of the total number of fatal accidents in 1914, 595 occurred in the anthracite mines of Pennsylvania, and 1879 in the bituminous mines and lignite mines. As usual, the most prolific cause of deaths was the falling of roof and coal, which killed 1131 miners—46 per cent of the total number of deaths. The death rate per thousand employees in the anthracite region was 3.31 in 1914, against 3.52 in 1913. In the bituminous regions the death rate per thousand was 3.19 in 1914, against 3.79 in 1913, and the death rate for the entire country in 1914 was 3.22, against 3.73 in 1913.

CONSUMPTION. More than 95 per cent of the anthracite and bituminous coal produced in the United States is consumed in the country, although efforts to build up an export trade, particularly with high grade bituminous coal, have resulted in a considerable expansion of business done with foreign countries. The quantity of coal consumed in the manufacture of coke in 1914 was 34,791,656 short tons, compared with 49,458,320 tons in 1913.

EXPORTS AND IMPORTS. The European war, which for the time being has eliminated Germany as an exporter of coal, was expected so to re-

strict Great Britain's coal exports, that the United States would be able to capture a large number of the foreign markets and build up a permanent export trade in coal. Beginning in August, when war was declared, exports of coal in the Atlantic seaboard increased, but not to the extent anticipated, for the reason that up to the end of 1914 England had not found it necessary to restrict the export of coal, and for the further reason that a large number of foreign coal users were temporarily out of the market. Shipments to South America and other countries increased about 40 per cent in 1914, but the exports to Canada, which is the largest user of United States coal, fell off 30 per cent. The result was that the total exports of anthracite and bituminous coal from the United States decreased from 22,141,143 long tons in 1913, to 17,632,094 in 1914. The imports of both anthracite and bituminous coal were unimportant.

WORLD'S PRODUCTION. The following figures were furnished to the United States Geological Survey by William G. Gray, statistician of the American Iron and Steel Institute, and Prof. G. A. Roush, editor of *Mineral Industry*.

THE WORLD'S PRODUCTION OF COAL, IN SHORT TONS

Country	1913	1914
United States	569,960,219	518,525,477
Great Britain	321,922,180	297,698,617
Germany	305,714,664	270,595,952
Austria-Hungary	59,647,957	.....
France	45,108,544	.....
Russia	35,500,674	.....
Belgium	25,196,869	.....
Japan	28,988,292	21,700,572
India	18,163,856	.....
China	15,432,200	.....
Canada	15,115,089	13,597,982
New South Wales	11,663,865	11,644,476
Transvaal	5,225,036	.....
Spain	4,731,647	.....
Natal	2,898,726	.....
New Zealand	2,115,834	.....
Holland	2,064,608	.....
Chile	1,362,334	.....
Queensland	1,162,497	1,180,825
Mexico	.....	.....
Bosnia and Herzegovina	927,244	.....
Turkey	.....	.....
Italy	772,802	.....
Victoria	668,524	.....
Orange Free State (Orange River Colony)	609,973	.....
Dutch East Indies	453,136	.....
Indo-China	.....	.....
Serbia	.....	.....
Sweden	401,199	.....
Western Australia	351,687	.....
Peru	301,970	.....
Formosa	.....	.....
Bulgaria	.....	.....
Rhodesia	237,728	.....
Rumania	.....	.....
Cape Colony (Cape of Good Hope)	67,481	.....
Korea	.....	.....
Tasmania	61,648	68,180
British Borneo	49,762	.....
Spitzbergen	.....	.....
Brazil	.....	.....
Portugal	27,653	.....
Venezuela	13,355	.....
Switzerland	.....	.....
Philippine Islands	.....	.....
Unspecified	.....	.....

Total b 1,478,000,000 b 1,346,000,000

a Estimated. b Approximate.

See also GEOLOGY.

COAST AND GEODETIC SURVEY. See EXPLORATION, *Oceanic*.

COAST DEFENSES. See MILITARY PROGRESS.

COCHIN-CHINA. A French colony, the southernmost division of French Indo-China (q.v.). Saigon is the capital, with about 68,000 inhabitants; Cholon has about 182,000. River and coast fishing, stock raising, and agriculture are carried on.

COCKROACHES. See INSECTS, PROPAGATION OF DISEASE BY.

COCKRELL, FRANCIS MARION. United States Senator from Missouri, died Dec. 13, 1915. He was born in Johnson Co., Mo., in 1834; was educated in the public schools; studied law; and was practicing in this profession at the outbreak of the Civil War, when he entered the Confederate army. He rose from the rank of captain to that of brigadier-general. Several times he was wounded during the war. At the siege of Vicksburg he was in command of one of the forts, and he commanded the Confederate forces at the battle of Long Jack, Mo., which, for the numbers engaged, was one of the bloodiest conflicts of the war. After the war he returned to practice law, and in 1875 was elected to the Senate, succeeding Carl Schurz, and served five terms, or until 1905. General Cockrell was defeated for the Senate at the time of the Republican landslide, which resulted in the election of Roosevelt. A Republican Legislature was elected in Missouri. Many prominent men were candidates for Senator, and Elihu Root, then Secretary of State, suggested that General Cockrell should be continued in the office by the Legislature. This the Republican members of the Legislature refused to do, and President Roosevelt appointed him a member of the Interstate Commerce Commission. He was one of the most useful members of the Senate during his term of office, and for a time a chairman of the Committee on Appropriations.

CODMAN, ROBERT. American bishop of the Protestant Episcopal Church, died Oct. 7, 1915. He was born in Boston in 1859; graduated from Harvard in 1882; three years later from the Harvard Law School; and in 1886 was admitted to the bar. For several years he was associated with his father in the practice of law, but after the death of his brother Archibald, an Episcopal clergyman, he decided to take up the work of a missionary priest. He became a student at the General Theological Seminary, and, following three years' study, was ordained to the priesthood. He acted as assistant in Philadelphia, and was then chosen rector of All Souls Church in Ashmark, Mass. He afterwards became rector of St. John's Church in Roxbury. He was elected Bishop of Maine in 1899, and was ordained in the following year.

COFFEE. See AGRICULTURE.

COFFIN, SELDEN JENNINGS. American astronomer and educator, died March 15, 1915. He was born in Ogdensburg, N. Y., in 1838; graduated from Lafayette College in 1858, and from the Princeton Theological Seminary in 1864. He was ordained to the ministry, but did not, however, preach. In 1864 he was appointed adjunct professor of mathematics, a professor in 1876, registrar in 1886, and professor of astronomy since 1873, at Lafayette College. He was the author of *Conic Sections* (1878); *Record of the Men of Lafayette* (1891). He revised the astronomy of Olmsted, and other astronomical works.

COINAGE. See COINS, VALUE OF.

COINS, VALUE OF. The following table gives

the value, as proclaimed by the United States Secretary of the Treasury, on Oct. 1, 1915, of foreign coins in the currency of the United States.

Of the total amount of coke made in 1914, 23,335,971 tons were beehived or oven coke, and 11,219,943 tons were by-product or retort coke. The decline in general resulted from the de-

Country	Standard	Monetary Unit	Value in U.S. Gold Dollar	Remarks. (a)
Argentina	Gold	Peso	\$0.9648	Currency: depreciated paper, convertible at 44 per cent of face value.
Austria-Hung'y	Gold	Crown	.2026	
Belgium	Gold	Franc	.1980	Member of Latin Union; gold is the actual standard.
Bolivia	Gold	Boliviano	.3898	12 1/4 bolivianos equal 1 pound sterling.
Brazil	Gold	Milreis	.5462	Currency: Government paper. Exchange rate about \$0.25 to the milreis.
British Colonies in Australia and Africa	Gold	Pound sterling	4.8665	
Canada	Gold	Dollar	1.0000	
Central American States:				
Brit. Honduras	Gold	Dollar	1.0000	
Costa Rica	Gold	Colon	.4658	
Guatemala	Silver	Peso	.3587	Currency: inconvertible paper, exchange rate 40 pesos = \$1.00.
Honduras	Silver	Peso	.8587	Currency: bank notes.
Nicaragua	Gold	Cordoba	1.0000	
Salvador	Silver	Peso	.8587	Currency: convertible into silver on demand.
Chile	Gold	Peso	.8650	Currency: inconvertible paper; exchange rate approximately, \$0.14.
China	Silver	Tael	{ Shanghai .5296 Haikwan .5899 Canton .5780	
Colombia	Gold	Dollar	1.0000	Currency: inconvertible paper; exchange rate, approximately, \$105 paper to \$1 gold.
Cuba	Gold	Peso	1.0000	
Denmark	Gold	Crown	.2680	
Ecuador	Gold	Sucre	.4867	
Egypt	Gold	Pound (100 piasters)	4.9481	The actual standard is the British pound sterling, which is legal tender for 97 1/2 piasters.
Finland	Gold	Mark	.1980	
France	Gold	Franc	.1980	Member of Latin Union; gold is the actual standard.
Germany	Gold	Mark	.2882	
Great Britain	Gold	Pound sterling	4.8665	
Greece	Gold	Drachma	.1930	Member of Latin Union; gold is the actual standard.
Haiti	Gold	Gourde	.9647	Currency: inconvertible paper; exchange rate, approximately, \$0.16.
India	Gold	Rupce	.8244	(15 rupees equal 1 pound sterling.)
Italy	Gold	Lira	.1930	Member of Latin Union; gold is the actual standard.
Japan	Gold	Yen	.4935	
Liberia	Gold	Dollar	1.0000	Currency: depreciated silver token coins; customs duties are collected in gold.
Mexico	Gold	Peso	.4985	Mexican exchange rate fluctuating, approximately, \$0.15.
Netherlands	Gold	Florin	.4020	
Newfoundland	Gold	Dollar	1.0139	
Norway	Gold	Crown	.2680	
Panama	Gold	Balboa	1.0000	
Paraguay	Silver	Peso	.3587	Currency: depreciated paper; exchange rate 1.550 per cent.
Persia	Gold	Kran	.1700	This is the value of the gold kran. Currency is silver circulating above its metallic value; exchange value of silver kran, approximately, \$0.0875.
Pern	Gold	Libra	4.8665	
Philippine Islands	Gold	Peso	.5000	
Portugal	Gold	Escudo	1.0806	Currency: inconvertible paper; exchange rate, approximately, \$0.70 1/2.
Rumania	Gold	Leu	.1930	
Russia	Gold	Ruble	.5146	
San Domingo	Gold	Dollar	1.0000	
Serbia	Gold	Dinar	.1930	
Siam	Gold	Tical	.3709	
Spain	Gold	Peseta	.1980	Valuation is for the gold peseta; currency is silver circulating above its metallic value; exchange value, approximately, \$0.20.
Straits Settlements	Gold	Dollar	.5678	
Sweden	Gold	Crown	.2680	
Switzerland	Gold	Franc	.1980	Member Latin Union; gold is actual standard.
Turkey	Gold	Piaster	.0440	100 piasters equal to the Turkish £.
Uruguay	Gold	Peso	1.0342	
Venezuela	Gold	Bolivar	.1980	

(a) The exchange rates shown under this heading are recent quotations and given as an indication of the values of currencies which are fluctuating in their relation to the legal standard. They are not to take the place of the Consular certificate where it is available.

COKE. The production of coke in 1914 was the smallest, except in 1908, since 1905. It amounted to 34,550,914 short tons, valued at \$88,334,217. The production in 1913 was 46,299,530 short tons, valued at \$128,922,273. As the value of coke has a tendency to follow the rate of production, the prices in 1914 declined.

creased amount of iron produced, as practically all the coke is employed in the manufacture of iron. See IRON AND STEEL.

The total amount of coal consumed in the manufacture of coke in 1914 was 51,623,650 short tons, valued at \$74,949,565. The total number of ovens and retorts in operation de-

creased in 1914 from 102,650 to 99,755. The tendency to consolidate into large units is shown in the manufacture of coke as in the other branches of industry, and the number of coke-making establishments has shown a steady decrease since 1909. The total number of establishments in 1914 was 536. Pennsylvania is the chief producer of coke, and is followed by Alabama and Illinois. Nearly all the coal producing States produce coke in some quantities. The imports of coke in 1914 amounted to 133,266 short tons, valued at \$551,104. The exports amounted to 663,585 short tons, valued at \$12,233,686.

COLD STORAGE. See **FOOD AND NUTRITION; STOCK RAISING AND MEAT PRODUCTION.**

COLGATE UNIVERSITY. An institution for higher education, founded in Hamilton, N. Y., in 1819. The total enrollment in all departments in the autumn of 1915 was about 600. The faculty numbered 48. There were no noteworthy benefactions received during the year. John F. Vichert was appointed professor of pastoral theology and dean of the seminary to take the place of Prof. William H. Allison, who had resigned. The productive funds at the end of the fiscal year 1915 were \$180,974. The library contained over 75,000 volumes.

COLLEGES. See **UNIVERSITIES AND COLLEGES.**

COLLEGES, AGRICULTURAL. See **AGRICULTURAL EDUCATION.**

COLLISIONS. See **RAILWAY ACCIDENTS.**

COLOMBIA. A republic of northwestern South America, bordering the Caribbean Sea and the Pacific Ocean. The capital is Bogotá.

AREA AND POPULATION. The boundary with Brazil is undefined, and a large extent of territory claimed by Colombia is also claimed by both Peru and Ecuador. Estimates of area, therefore, differ widely. One estimate is 465,700 square miles; another, which probably more nearly approximates the eventual area of the republic, is 435,100 square miles. In 1835 the population was supposed to be about 1,686,000; in 1851, about 2,243,000; in 1871, about 2,951,000; in 1905, 4,533,777; in 1912 (census of March 5), 5,472,604. All of these figures include the population of Panama, which appears in the 1912 census with an estimated 400,000. With this figure deducted, the population of the republic becomes 5,072,604. But even the latter figures include some estimates. Thus the territories (intendencias and commissaries) of the republic are credited with 231,522 inhabitants, but this number includes estimates aggregating 94,000, mostly uncivilized Indians.

The population of the larger towns in 1912 was as follows (the figures relate to *municipios*, that is, districts which are organized for municipal purposes and which usually comprise rather extended areas): Bogotá, 121,257; Medellín, 71,004; Barranquilla, 48,907; Cartagena, 36,632; Manizales, 34,720; Sonrón, 29,346; Pasto, 27,760; Cali, 27,747; Aguadas, 26,423; Ibagué, 24,693; Palmira, 24,312; Neiva, 21,852; Montería, 21,521; Yarumal, 21,250; Cúcuta, 20,364; Bucaramanga, 19,735; Miraflores (Boyacá), 19,150; Loricá, 19,005; Popayán, 18,724; Cartago, 18,618; Pereira, 18,428; Andes, 18,391; Salamina, 18,195; Fredonia, 18,176; Bolívar (Cauca), 17,738; Abejorral, 17,508; Santa Rosa de Cabal, 17,009.

EDUCATION. Illiteracy is prevalent, and pri-

mary instruction, though free, is not compulsory. The number of primary schools reported for 1914 is 4184, with 280,367 pupils. Secondary schools in 1914 numbered 58 public and 246 private, with 6283 and 18,095 students, respectively. Most of the secondary schools are under the management of Roman Catholic orders. Normal schools in 1914 numbered 28, with 1728 students (649 male, 1079 female). There are a few schools for special or professional instruction. Bogotá has long been a conspicuous seat of Roman Catholic scholasticism. Its university, founded in 1572, has faculties of letters and philosophy, jurisprudence and political science, medicine and natural science, and mathematics and engineering. The University of Bogotá and the School of Mines at Medellín are national institutions. Besides Bogotá, there are several other universities so-called, as the University of Medellín, the University of Cauca, at Popayán, founded 1910, and the University of Magdalena, at Santa Marta, founded 1913. The state religion is Roman Catholicism.

PRODUCTION. In the economic development of the country, both agriculture and mining are important, and in some sections cattle raising is a large and profitable industry. The republic has a vast amount of fertile soil, but only a small proportion has been brought under cultivation. Industrial progress is handicapped by inadequate means of transportation. The leading crop commercially is coffee. Other leading products are bananas, ivory, nuts, cacao, sugar-cane, cotton, tobacco, and cereals. The mineral resources are of exceptional importance, especially in the department of Antioquia, and include gold, copper, lead, zinc, mercury, iron, platinum, salt, and emeralds. Manufactures, except Panama hats, are little developed.

COMMERCE. Imports and exports have been valued as follows:

	1911	1912	1913	1914
Imports—	\$18,108,863	\$23,964,623	\$28,535,800	\$20,979,229
Exports—	22,375,899	32,221,746	34,815,800	32,682,884

In 1912 and 1913, respectively, leading imports were as follows, in thousands of dollars: textiles, 10,547 and 11,455; metals, 2917 and 3164; foodstuffs and condiments, 3055 and 2817; railway cars and vehicles, 1032 and 1164; beverages, 836 and 1051; drugs and medicines, 838 and 947. Quantity of leading exports, in metric tons, in 1912: coffee, 559,993; bananas, 105,263; ivory nuts, 11,600; cattle hides, 5168; leaf tobacco, 3262. The rubber export in 1912 amounted to 503 metric tons. Value of leading exports in 1912 and 1913, respectively, in thousands of dollars: coffee, 16,778 and 18,270; gold, 4610 and 4100; cattle hides, 2262 and 3181; bananas, 1997 and 3060; Panama hats, 1175 and 960; tobacco, 442 and 921; ivory nuts, 755 and 819; platinum, 594 and 584; rubber, 736 and 378.

Trade by countries, in thousands of dollars:

	Imports		Exports	
	1912	1913	1912	1913
United States	7,612	7,630	15,833	18,862
United Kingdom	7,839	5,837	4,376	5,566
Germany	4,201	4,012	1,854	8,216
France	2,012	4,409	625	798
Belgium	571	499	....	594

Total, including other. 23,965 28,536 32,222 34,816

COMMUNICATIONS. The development of Colombia's natural resources is greatly impeded by the lack of adequate transportation facilities. Roads in general are merely mule tracks, though some of the main thoroughfares have been made, by the government, usable for ordinary vehicles and automobiles. To a considerable extent inland traffic is carried on by means of the Magdalena River and its tributaries. The railways form no continuous system, but consist of various short lines engaged in local traffic. The length of railway in operation in 1914 is reported at 708 miles, belonging to two States and nine companies. Reported length of telegraph lines, over 19,000 kilometers (over 11,800 miles). Post offices, over 800.

FINANCE. The monetary unit is the peso, equivalent to the American dollar. Silver coins fluctuate in value with the price of silver. The legal value of the paper peso is one one-hundredth of the monetary unit, but its actual purchasing power is somewhat variable. Exact reports of receipts and disbursements are not available. For 1914, the estimated revenue was 16,500,000 pesos gold; estimated expenditure for 1915, 18,500,000 pesos gold. The estimates submitted to the congress for the fiscal year 1916 were 11,900,000 pesos gold revenue, and 16,389,000 pesos gold expenditure. Customs revenue in 1914 amounted to 9,498,683 pesos gold.

Foreign debt, Jan. 1, 1915: consolidated, £2,174,600; other, £1,753,528 (including the 1913 loan of £1,182,248); total, £3,928,128. Internal debt, July 1, 1914, 2,365,684 pesos gold. There is, besides, an enormous outstanding paper currency.

ARMY. The national army of Colombia was being developed by the government supported by the good will of the citizens. Military service is compulsory, but the quota of recruits is drawn upon only to provide a force of about 6000 or 7000 men, though on a war basis these troops could be increased in number to about 50,000. Colombia received her first military instruction from Chile in 1907, when a military school was founded, and successively the government founded a school for officers, a course of application, a war college, and in 1911 a general staff, by which plans for compulsory service were prepared.

GOVERNMENT. The President is elected by direct vote for four years. He is assisted by a cabinet of eight members. There is no vice-president, but two *designados*, first and second, are elected by the Congress to succeed to the presidency, respectively, in case of the chief executive's death or disability. The Congress consists of the Senate (35 members, elected indirectly for four years) and the House of Representatives (92 members, elected by direct vote for four years). For the term ended Aug. 7, 1914, the President was Carlos E. Restrepo. For the following term José Vicente Concha was elected. First *designado*, Marco Fidel Suárez; second *designado*, Jorge Holguín.

HISTORY. *Relations with the United States.* Early in January the proposed treaty between the United States and Colombia came up for consideration in the United States Senate. There was much opposition to it because it contained provisions for the payment of \$25,000,000 to the southern republic to indemnify it for its claims to the Panama Canal Zone and for an apology for the method which was used in se-

curing the Canal Zone territory. Ex-President Roosevelt was loud in his denunciations of the proposed treaty. In February, Colonel Roosevelt published several articles on the subject which caused the Colombia legation in Washington to publish an answer to them and the legation in Paris to demand an apology from *Le Temps* for having republished them with comments. Notwithstanding the fact that popular sentiment in the United States appeared to favor the adoption of the treaty and 76 importing houses in New York City petitioned for favorable action, the Colombian treaty was allowed to die in the Senate Committee.

Internal Conditions. Advices from Bogotá in March stated that the President of Colombia, acting under a new law giving him extraordinary fiscal powers to meet the situation caused by the falling off in the customs receipts since the war began, had doubled the duty on stamped paper, doubled the inland revenue stamp tax, decreed the coinage of 2,000,000 pesos in silver, reduced the salaries of public officials 5 per cent, and taxed the exports of gold and valuable woods. In June, Colombia adopted a gold basis, giving up the silver standard which had been in operation for 21 years. In July, the National Congress met, selecting José María Gonzales Valencia president of the Senate, and Rafael Quizano Gómez president of the House.

COLORADO. **POPULATION.** The estimated population of the State on July 1, 1915, was, according to the United States Bureau of the Census, 935,799.

AGRICULTURE. The acreage, production, and value of the principal crops, as estimated by the United States Department of Agriculture, in 1914-15 were as follows:

		Acreage	Prod. Bu.	Value
Corn	1915	470,000	11,280,000	\$6,204,000
	1914	462,000	10,626,000	6,376,000
Wheat	1915	560,000	18,310,000	10,648,000
	1914	475,000	11,312,000	9,842,000
Oats	1915	800,000	11,700,000	4,797,000
	1914	825,000	18,000,000	5,850,000
Rye	1915	30,000	525,000	868,000
	1914	21,000	368,000	239,000
Barley	1915	180,000	4,680,000	2,246,000
	1914	108,000	8,966,000	2,181,000
Potatoes	1915	53,000	7,155,000	8,935,000
	1914	73,000	8,760,000	4,880,000
Hay	1915	970,000	2,184,000	16,218,000
	1914	970,000	2,328,000	17,227,000

MINERAL PRODUCTION. The total value of the output of gold, silver, copper, lead, and zinc in 1914 was \$33,460,126, compared with \$35,450,585 in 1913. The gold produced was valued at \$19,883,105. There were produced 8,796,065 ounces of silver; 74,211,898 pounds of lead; 6,639,173 pounds of copper; and 96,774,954 pounds of zinc. There was an increase of \$1,176,189 in gold; and there was a decrease of 529,190 ounces in silver; 13,685,875 pounds in lead; 588,653 pounds in copper; and 22,571,465 pounds in zinc. In addition to the decrease in quantities of silver and the base metals, the falling off in the average value of these materials caused a decrease in value of \$768,270 for silver, \$973,238 for lead, and \$1,747,877 for zinc. Cripple Creek produced 6 per cent of the total gold of the State, with a total of \$11,996,116, as compared with \$10,905,083 in 1913. This is the largest production for any year since 1908. Cripple Creek, to the end of 1914, has produced \$258,786,653 in gold.

Lake County, which includes Leadville, pro-

duced 3,810,830 ounces of silver. The production of copper in the State was derived from the treatment of mixed ores in which copper was of minor importance. The total production of coal in 1914 was 8,170,559 short tons, valued at \$13,601,718. Compared with the production of 1913, this is a decrease of 1,061,951 tons, or 11.5 per cent in quantity, and \$433,372 in value. The small production was largely due to the condition of the strike which began in September, 1913, and prevailed through most of 1914.

TRANSPORTATION. The railway mileage of the State, on Jan. 1, 1915, was 5579. Of this, 4255 was standard gauge, and 1323 was narrow gauge. The roads having the longest mileage were the Denver and Rio Grande, 986; Union Pacific, 587; and the Atchison, Topeka, and Santa Fe, 512.

EDUCATION. The latest statistics available for education are for 1912. In that year the total school population between the ages of 6 and 21 was 227,187. The total enrollment in the graded schools below high school was 109,274. The enrollment in rural schools was 48,614, and in the high schools, 11,241, making a total enrollment of 173,129. Teachers in the graded schools below high schools numbered 6383, and in rural schools 2042. The average yearly salary of female teachers was \$656.19, and of male teachers, \$661.53.

CHARITIES AND CORRECTIONS. The charities and correctional institutions of the State include: The State Home for Dependent and Neglected Children, Soldiers' and Sailors' Home, Industrial Workshop for the Adult Blind, The State Home and Training School for Mental Defectives, State Insane Asylum, Industrial School for Boys, Industrial School for Girls, State Penitentiary, and State Reformatory. The total population of these institutions on Oct. 30, 1915, was 3112. The total expenditures for their maintenance for the twelve months ending June 30, 1915, was \$672,884. The Legislature of 1915 passed a measure providing for a lunacy commission in each county, to investigate and report to the County Court all cases of insanity. This Legislature appropriated \$450,000 for the maintenance and erection of buildings. A State board of corrections was created, in which was vested the control of the penitentiary, reformatory, and insane asylum.

POLITICS AND GOVERNMENT. Prohibition under the constitutional amendment adopted on Nov. 3, 1914, was to become effective Jan. 1, 1916. The State-wide prohibition bill contains provision for the enforcement of the prohibition constitutional amendment. It prohibits interstate and intrastate shipment of liquor for sale or gift except for medicinal and sacramental purposes. A workman's compensation law was passed by the Legislature. See **WORKMEN'S COMPENSATION**.

The House of Representatives on March 10th passed three bills, the effect of which would have been to abolish the juvenile court at Denver, and remove from office Judge Ben Lindsey, who for many years presided over that court, and had a national reputation for his method of dealing with juvenile offenders. The ostensible purpose of the bill was economy, but it was commonly known that the real object was to remove Judge Lindsey from office. The latter's term had two more years to run. The bill passed both houses, but the Governor vetoed it. On March 13th, Judge Lindsey asked the district

court for warrants of arrest against Dr. Mary Elizabeth Bates; E. R. Whitehead, secretary of the State Humane Society; Frank Rose, a lawyer; and R. P. Rawlings. He charged them with a conspiracy to defame his character. The House of Representatives on March 15th expelled Representative W. W. Howland on charges of perjury. This action followed an investigation by a special committee, which found that Howland had received a sum of money which he admitted came from Dr. Mary Elizabeth Bates, and was to pay a woman detective for work in shadowing the probation officer of the juvenile court. On April 12th, report of the grand jury exonerated Judge Lindsey from charges of misconduct, which had been brought against him. Frank Rose was indicted on a charge of criminal libel in connection with affidavits reflecting upon the character of Judge Lindsey. On January 12th, the latter was arrested on a charge of contempt of court, and connivance in the commission of perjury. This charge grew out of the refusal of Judge Lindsey, on January 8th, to divulge on the witness stand in the trial of Berta Wright, accused of murder, a confidential conversation with Neal Wright, a twelve year old son of the defendant. Judge Lindsey said that the whole juvenile court work was founded upon the protection of children in giving confidence to him, and that what he had learned from Neal Wright came to him as a privileged communication. Judge Lindsey was held guilty for contempt of court, and was fined \$500 and costs on November 15th. Wards of the juvenile court, over which he presided, at once started a movement to collect 50,000 pennies from the children of Denver with which to pay the fine.

W. W. Howland, who, as noted above, was expelled from the House of Representatives on a charge of perjury, was acquitted on July 2nd. Judge Perry of the District Court upheld the contention of his attorneys that alleged false statements of the defendant before a grand jury did not constitute perjury under the statute of the State.

STATE OFFICERS. Governor, George A. Carlson; Lieutenant-Governor, Moses E. Lewis; Secretary of State, John E. Ramer; Auditor, Harry E. Mulnix; Treasurer, Allison E. Stocker; Superintendent of Public Instruction, Mary C. C. Bradford; Attorney-General, Fred Farrar.

SUPREME COURT. Chief Justice, William H. Gabbert; Associate Justices, S. Harrison White, William A. Hill, James C. Garrigues, Morton S. Bailey, and Tully Scott.

COLORADO, UNIVERSITY OF. A State institution for higher education, founded in 1876 at Boulder, Colo. The total enrollment in all departments in the autumn of 1915 was 1400. This does not include the enrollment in the summer session, extension division, or the pupils in the training school. The faculty numbered about 200. William R. Arthur, LL.B., and Fred G. Filson, LL.B., were appointed professors of law. The university is supported chiefly by legislative appropriations. The annual income from this source is about \$320,000. Other productive funds amount to about \$75,000. The library contained 80,000 volumes.

COLORADO INDUSTRIAL DISPUTES. See **ARBITRATION AND CONCILIATION**, *Colorado Industrial Disputes Investigation Act*.

COLORED METHODISTS. See **METHODISTS, COLORED**.

COLTON, CHARLES HENRY. American Roman Catholic bishop, died May 9, 1915. He was born in New York City in 1848; graduated from St. Francis Xavier College in 1872; afterwards studied at St. Joseph's Seminary at Toledo; and was ordained a priest in 1876. From that year until 1903 he served as assistant and pastor at St. Joseph's Church, New York. During the same period he was also chancellor of the diocese of New York. He was made bishop of Buffalo, Aug. 5, 1903. He was the author of: *Seedlings* (1906); *My Trip through Rome and the Holy Land* (1906); and *Buds and Blossoms* (1910).

COLUMBIA UNIVERSITY. An institution for higher learning, founded in 1754 in New York City. The total enrollment in all departments in the autumn of 1915 was 16,404. The faculty numbered 981. The most notable benefactions received during the year were those from Mr. William K. Vanderbilt for the new medical site, \$113,750; from the estate of Joseph Pulitzer for the endowment fund of the School of Journalism, \$50,000; from an anonymous donor for the better equipment of the chemical laboratories in Havemeyer Hall, \$30,000; from Mrs. Samuel W. Bridgman to establish a fund for the endowment of a research fellowship, \$20,000. The productive funds at the end of the fiscal year amounted to \$30,260,903, and the income to \$1,206,324. The library contained about 550,000 volumes.

COMAN, KATHERINE. American educator, died Jan. 11, 1915. She was born in Newark, Ohio, in 1857, graduated from the University of Michigan in 1880; was professor of history at Wellesley College, 1883-1900; and, from 1900-13, professor of economics in the same college. She retired as professor emeritus in 1913. Her published writings include: *The Growth of the English Nation* (1895); *History of England* (1899); *History of England for Beginners* (1901); *Industrial History of the United States* (1905); *Economic Beginnings of the Far West* (1911).

COMETS. See ASTRONOMY.

COMMERCE. For foreign trade, see UNITED STATES, and articles on foreign countries; for internal trade, see UNITED STATES, and articles on various industries; and FINANCIAL REVIEW.

COMMERCE COMMISSION, INTERSTATE. See RAILWAYS, *passim*.

COMMISSION ON INDUSTRIAL RELATIONS. See EMPLOYERS' ASSOCIATIONS; and INDUSTRIAL RELATIONS COMMISSION.

COMMISSION PLAN. See MUNICIPAL GOVERNMENT.

COMMITTEE ON INDUSTRIAL RELATIONS. See INDUSTRIAL RELATIONS, COMMITTEE ON.

COMORO ISLANDS. See MAYOTTE AND THE COMORO ISLANDS.

COMPENSATION FOR WORKMEN. See WORKMEN'S COMPENSATION.

COMSTOCK, ANTHONY. American public official, died Sept. 21, 1915. He was born in New Canaan, Conn., in 1844, and received an academic education. In 1863 he joined the Seventeenth Connecticut Volunteers, and served throughout the Civil War, receiving an honorable discharge in 1865. He returned to New York in 1867, and for a time worked in various capacities in wholesale business houses. On March 5, 1873, as special agent for the recently organized Society for the Suppression of Vice—a position he held for the rest of his life—he

caused the arrest of venders of obscene books, and shortly afterwards gave most of his time to investigating the sale of such books in New York City. He was, in addition, appointed special agent in the Post Office Department, and served the United States government without pay in that capacity until January, 1907. During that time he made more than 3600 arrests, and seized more than 155 tons of obscene literature, and other printed matter. His efforts were also directed toward the suppression of policy sharks, and lotteries, and other gambling devices. He succeeded in placing upon the statute books many laws for the suppression and control of these and other iniquities. The act of Congress in 1873, with the amendment of 1876, making it a felony to send obscene matter through the mail, was drafted by him. He also drew up the act which drove public lotteries out of the United States. His zeal in suppressing the exhibition of what he considered to be immodest paintings brought him much notoriety and abuse; but the value of his work as a whole is beyond question. He was the author of: *Frauds Exposed* (1880); *Gambling Outrage* (1887); *Morals vs. Art* (1887); and *Traps for the Young* (1890).

CONANT, ALBAN JASPER. American artist, died Feb. 3, 1915. Born in Chelsea, Vt., in 1821, and graduated from the Gouverneur Wesleyan Seminary in 1844, he removed to Missouri, and for eight years was curator at the University of Missouri. He founded the school of mines and metallurgy, of which for three years he was supervisor. His distinction, however, lies in his portrait painting. "The Smiling Lincoln" was from his brush, as were also portraits of Major Anderson, who commanded Fort Sumter, of General Sherman of members of Lincoln's cabinet, and of other noted men of his day. His portrait of James McCosh is in the Metropolitan Museum of Art in New York City. In addition to his portraits, he painted a number of historical scenes, the best known of which is perhaps "The Burial of De Soto." He wrote several books, among them: *The Archaeology of the Missouri Valley*; *Footprints of Vanished Races in the Missouri Valley*; and *My Acquaintance with Lincoln*. He received degrees from Madison University and the University of Missouri.

CONANT, CHARLES ARTHUR. An American economist and writer, died July 6, 1915. He was born in Winston, Mass., in 1861, and was educated in public and private schools. In 1887 he became a Washington correspondent of the *New York Journal of Commerce*, the *Springfield Republican*, and other papers. Until 1901 he continued in newspaper work, establishing a national reputation as an expert on financial and monetary matters. In 1901 he was appointed special commissioner of the War Department in the Philippines, and in this capacity made a report on the monetary and financial conditions in the islands on which the government based the remodeling of the currency system in the Philippines. Two years later he went to Mexico, to aid in the plans for the monetary reform of that country. He became a member of the Commission of International Exchange of the United States in the same year. He was, in 1906, a member of the special committee of the New York Chamber of Commerce on currency reform; and was an officer and director in several large financial institutions. He took an active inter-

est in politics, and in 1894 was Democratic candidate for Congress. He left the Democratic party as a result of the silver issue in 1896, and was a delegate to the Gold Democratic convention in that year. His published writings include: *The United States in the Orient* (1900); *Alexander Hamilton* (1901); *Wall Street and the Country* (1904); *The Principles of Money and Banking* (1905); *History of Modern Banks of Issue* (1909). He also contributed financial and economic articles to the important magazines.

CONATY, THOMAS JAMES. American Roman Catholic bishop, died Sept. 18, 1915. He was born in Ireland, in 1847, but removed to Canada, and from 1863 to 1867 studied at Montreal College. Graduated from the Holy Cross College in 1867, and from the Theological School in 1872, in the last-named year he was ordained a priest. From 1880 to 1897 he was pastor of the Church of the Sacred Heart at Worcester, Mass., and in 1896 succeeded Bishop Keane as rector of the Catholic University at Washington. In the following year Pope Leo XIII conferred on him the title of domestic prelate, and in 1901 nominated him titular bishop of Samose. He was appointed to the see of Monterey and Los Angeles, Cal., in 1903. Bishop Conaty was identified with many important educational and social movements. He founded, and for four years edited, the *Catholic School and Home Magazine*. In 1887-88 he was president of the Catholic Total Abstinence League of North America, and was one of the organizers, and was president from 1893 to 1897, of the Catholic Summer School at Plattsburgh, N. Y. He was the author of *Bible Studies for Use in Schools and Colleges* (1898).

CONCILIATION, INDUSTRIAL. See **ARBITRATION AND CONCILIATION, INDUSTRIAL**; and **STRIKES AND LOCKOUTS**.

CONCRETE. The various problems connected with the mixing and handling of concrete were under discussion during 1915, and it was realized by many engineers that their mixing periods, spouting of wet cement, carting over long distances, and other like practices, tended toward a non-uniform and unsatisfactory concrete. There was a tendency manifested during the year in favor of longer mixing and more care in preparing the concrete, and engineers were paying more attention to the work of contractors in depositing the concrete in place. Tests made at the United States government laboratory at Pittsburgh during the year, where concrete was made with gravel, limestone, and broken slag for coarse aggregate, showed the respective merits of these materials. Using standard 8 x 16-inch cylinders of 1:2:4 concrete and testing at the end of 7 days, 28 days, 90 days, and 6 months, it was found that the concrete with slag aggregate was practically the same strength as the limestone concrete, and both averaged much higher at all stages than the gravel concrete.

On Nov. 13, 1915, Judge Robert E. Lewis, of the Colorado Federal District Court, rendered a decision declaring six concrete bridge patterns void, on the ground that the alleged inventions were non-patentable at the time of application. This was in a suit of Daniel B. Luten against Well County, Colo., and the principle laid down was that the arrangement of metal parts in a body of reinforced concrete to resist stresses in-

volved merely mechanical design and not invention. This decision was of interest on account of its broad application, and the number of reinforced concrete patents on which royalties were being paid that necessarily would be involved. It also was considered as having a bearing on structural patents generally, so that the question of whether the decision would be upheld in the higher courts was a matter of considerable interest.

REINFORCED CONCRETE. During the year progress was being made on the notable group of buildings for the Massachusetts Institute of Technology on the banks of the Charles River, Cambridge, Mass., in which reinforced concrete plays an important part. The central building of the group is surmounted by a large dome, and while the external construction is of limestone the structure itself is of reinforced concrete. The dome rises to a height of 147½ feet above the general level, and 65 feet above the parapets of the surrounding buildings. The concrete was poured from a tower 190 feet high, about 100 feet away from the dome centre, with a chute supported by an intermediate tower. The completion of various stadiums for universities showed a development in design as well as in construction for these great amphitheatres. That for the College of the City of New York, for example, supplied facilities not only for athletic contests, but for pageants and open air dramatic or musical functions. For these stadiums increased decorative effects were being secured.

In a six-story reinforced concrete structure completed during the year for the *Youth's Companion*, Commonwealth Avenue, Boston, Mass., a new type of slab reinforcement was employed, which was claimed to result in a saving of from 20 to 40 per cent in the steel required, as compared with ordinary types. This building, which was to be used for the printing, editorial, and business departments of the weekly paper, was 165 x 100 feet, with columns so spaced that the floor slabs were 14 feet 9 inches by 20 feet 6 inches. The floor reinforcement consisted of three separate units: a series of short rods at the bottom of the slab which formed the cross bands, the bottom steel at the centre of the panel, and the top steel over the column head, a patented arrangement which served to give strength and economy of material. Three standard thicknesses of floor slab were used—one 9 inches thick for the second floor, which carried the heavy printing presses, with a live load of 300 pounds per square foot; an 8-inch slab for the basement over the sub-basement, and for the first, third, and fourth floors, used as storage rooms, and the remainder of the printing plant, designed for a 200-pound per square foot live load; and a 7-inch slab for the fifth and sixth floors and the roof, designed for a live load of 100 pounds per square foot.

CONDENSED MILK. See **DAIRYING**.

CONDON, EDWARD O'MEAGHER. Irish patriot, died Dec. 15, 1915. Born in Ireland, he removed to New York City, prior to 1861, and served throughout the Civil War. After the war he returned to Ireland, and was prominent in the Fenian movement. On account of his activities in obtaining the release of Kelley and Deasey, he was condemned to die, but because he was an American citizen this sentence was commuted to life imprisonment. At the close of twelve years

in British prisons, he was pardoned, but exiled. He came to the United States, and obtained a position as supervising architect in Washington, which position he filled until a short time prior to his death.

CONFERENCES OF CHARITABLE AND SOCIAL ORGANIZATIONS. See CHARITIES, *passim*.

CONGO, BELGIAN. A central African colony of Belgium (the former Congo Free State). The capital is Boma. All the statistics given below are from the official report of the Belgian colonial minister.

AREA AND POPULATION. The colony covers an area of 2,365,000 square kilometers (913,127 square miles); white population (Jan. 1, 1912), 5465. No official estimate of native population is given; other sources vary from 9 to 20 millions. Besides Boma, important towns are Matadi, Banana, Leopoldville, Stanleyville, Kambove, Niangara, Bandundu, etc.

PRODUCTION. The chief products of the country are shown in the list of exports, rubber leading in importance. The Kilo gold mine, in the Ituri basin, not far from Lake Albert, has 8 experts and 1750 negro workers, and produced (1910) 867 kgs. of gold. Gold is also found in the Katanga district.

Sale of crown lands in 1910, about 14 hectares, at a total price of 241,528 francs; crown lands rented in 1910, 4062 hectares, rental, 18,345 francs. A large proportion of these lands is in the Katanga district.

COMMERCE. Total imports (general trade) in 1910, 43,979,000 francs; exports, 95,599,000 francs. In 1911, 58,385,000 and 78,955,000 francs. In 1912, 61,864,000 and 83,465,000. Exports, details, and totals (general trade), are shown below, values in thousands of francs:

Articles	1907	1908	1909	1910
Rubber	57,330	40,144	60,171	76,030
Palm oil	1,741	1,376	1,095	2,016
Palm nuts	2,522	2,056	2,199	3,101
Ivory	11,034	9,597	10,554	9,361
Various	4,914	3,694	4,195	5,091
Total exports	77,541	56,867	78,014	95,599

Exports of the principal products in the special trade are shown in the table below for comparative years, 1901-05 yearly average for the period, in thousands of francs:

	1901-05	1910	1911	1912
Rubber	44,056	51,016	34,427	34,519
White copal	739	3,343	1,314	6,385
Ivory	4,284	6,056	5,683	5,552
Copper			1,834	4,112
Gold	140	2,515	3,119	3,832
Palm nuts	1,489	2,657	2,879	2,771
Palm oil	986	1,798	1,732	1,253
Cacao	150	1,071	896	1,115

Imports in 1912 to the value of 35,785,348 francs came from Belgium, and exports valued at 53,883,269 francs went to Belgium; United Kingdom, 5,670,133 francs imports, and 557,920 francs exports; Germany, 4,078,710 imports; France, 1,143,738 imports; Netherlands, 1,113,487 imports, and 1,172,345 exports; etc. There were entered at the ports in the 1912 trade, 705 vessels of 1,044,864 tons.

RAILWAYS. On Jan. 1, 1912, the various railway lines with holdings, were as follows: Congo Railway Company, 400 kilometers; Stanleyville-Ponthierville, 125; Kindu-Kongolo, 355; Lua-

laba-Tanganyika, 300 (approximate length under construction); Rhodesian frontier-Elisabethville and Elisabethville-Bukama, 275 in operation and 168 under construction; Boma-La Lukula, 80. In 1914 the Cape-to-Cairo Railway reached the copper district in the centre of the colony.

The construction of the railway north from Kambove to Bukama was actively continued during 1915. The total distance was 204 miles, and December 31st the rails were laid for 69 miles, and in March, 1915, 86 miles had been finished and the roadbed completed over 96 miles. The railway had reached the high Biano plateau, which was free from tsetse fly, making it possible to land breeding stock there by rail. The headquarters of the construction was then moved from Kambove to 66 miles beyond, and this section of the road was used for the regular transport of passengers and merchandise. Kambove is connected by rail with South Africa via Elisabethville, and, once Bukama is reached, there will be complete rail and water connection between South Africa and Boma. The railway under construction between Kabalo, on the Luabala River, and Lukuga, on Lake Tanganyika, a distance of about 250 miles, was practically completed, but had not been pushed quite to the shore of the lake, where the Germans were masters for a time. The final link in the line of communication between the mouth of the Congo and Lake Tanganyika was completed during the year. Ocean going vessels could go as far as Matadi, 85 miles from the mouth of the river; thence a railway of 260 miles runs to Stanley Pool, the river from that point being again navigable to Stanleyville, a distance of 1000 miles.

FINANCE AND GOVERNMENT. Financial statistics appear in the table below in thousands of francs for four years (1913 and 1914 budgets):

	1911	1912	1913	1914
Revenue	40,870	45,368	40,418	30,451
Expenditure	*59,658	†66,539	50,933	‡63,076

* Including 12,222,443 francs extraordinary. † Including 16,818,660 francs extraordinary. ‡ Including 11,139,573 francs extraordinary.

The total debt amounts to 278,747,200 francs. A Governor-General administers the colony.

CONGO, FRENCH. The former name of French Equatorial Africa (q.v.). The name was changed in 1910.

CONGO FREE STATE. See CONGO, BELGIAN.

CONGREGATIONALISM. According to official statements the total membership of this denomination in 1915 was 763,182. There were 6093 churches; 5923 ministers, of whom 4095 were pastors and 1828 were without charge; Sunday School pupils, 757,873. There were 3120 Young People's Societies of Christian Endeavor, with 133,474 members; 1527 men's organizations, with 85,811 members. The total contributions to all branches of the work of the denomination in 1915 amounted to \$2,272,040, and the total expenditures, \$10,716,311. The average salary of 4693 churches was \$968; the value of church property was \$84,565,377.

The national societies include the Congregational Educational Society, the American Congregational Association, the American Board of Commissioners for Foreign Missions, the Congregational Home Missionary Society, the American Missionary Society, the Congrega-

tional Church Building Society, the Congregational Board of Ministerial Relief, the Congregational Sunday School and Publishing Society, the Woman's Home Missionary Federation, and the Woman's Board of Missions. Foreign missions are under the control of the American Board of Commissioners for Foreign Missions, to which Congregationalists contributed \$313,527 in 1915. Home missions are carried on by the Congregational Home Missionary Society, in 28 States and Territories, the total receipts for home missions in 1915 amounting to \$325,477. In 1915 there were about 1700 missionaries under commission for a whole or a part of the year. The theological seminaries are at Cambridge, Mass. (Andover Theological Seminary), Atlanta, Bangor, Hartford, Chicago, Oberlin, Talladega, Berkeley, and Yale. The social work of the Church is in the hands of the Social Service Commission of the Congregational Church, which is a development from the work of the Department of Labor and Social Service of the Congregational Brotherhood of America. The general administration of the Church is under the control of the National Council. The latter's session for 1915 was held at New Haven, Conn. The officers elected were: Moderator, Hon. H. M. Beardsley; assistant moderator, Rev. A. C. Garner; secretary, Rev. Hubert C. Herring; treasurer, John J. Walker.

CONGREGATIONAL METHODIST CHURCH. The denomination has the larger part of its membership in the Southern States. It has a publishing house at Ellisville, Miss. The only educational institution under its control is the Atlanta Bible School, and in that city is published its official journal, *The Messenger*. There were in this denomination in 1914, 15,629 communicants, 333 churches, and 337 ministers.

CONGRESS. See UNITED STATES.

CONNECTICUT. POPULATION. The population of the State, as estimated by the United States Bureau of the Census, on July 1, 1915, was 1,223,583.

AGRICULTURE. The acreage, production, and value of the principal crops, as estimated by the United States Department of Agriculture, in 1914-15, were as follows:

	Acreage	Prod. Bu.	Value
Corn .....1915	65,000	8,250,000	\$2,782,000
1914	61,000	2,806,000	2,497,000
Oats .....1915	13,000	422,000	232,000
1914	11,000	319,000	175,000
Rye .....1915	7,000	150,000	158,000
1914	7,000	133,000	180,000
Potatoes ...1915	24,000	2,280,000	2,189,000
1914	24,000	3,360,000	2,184,000
Hay .....1915	365,000	a 493,000	9,860,000
1914	375,000	469,000	9,146,000
Tobacco ...1915	22,200	b 29,970,000	5,095,000
1914	20,200	35,754,000	6,614,000

a Tons. b Pounds.

TRANSPORTATION. The total length of track operated in Connecticut in 1915 was 2725. In addition there were 915 miles of second track, 129 miles of third track, and 128 miles of fourth track. The longest mileage was that of the New York, New Haven, and Hartford—2004; the Central New England Railway—303; the Central Vermont—411. For developments in regard to the suit against the New York, New Haven, and Hartford Railway in 1915 see **RAILWAYS**.

EDUCATION. The total school population in 1915 was 276,349. The total number in public schools was 211,975, with an average daily attendance of 168,060. The teachers male and female numbered 5857. The total school expenditures amounted to \$8,112,003.

CHARITIES AND CORRECTIONS. The charitable and correctional institutions of the State include the Soldiers' and Sailors' Home at Noroton Heights, Connecticut Hospital for the Insane at Middletown, Norwich State Hospital for the Insane, Connecticut State Prison at Wethersfield, Connecticut School for Boys at Meriden, Connecticut Industrial School for Girls at Middletown, Connecticut Colony for Epileptics at Mansfield, and Connecticut School for Imbeciles at Lakeville.

POLITICS AND GOVERNMENT. The Legislature met in 1915, but passed measures chiefly local and unimportant. A woman's suffrage bill was killed in the House of Representatives by a unanimous vote and without comment from any member. It is now necessary for advocates of the measure to wait two years before bringing it again to the attention of the Legislature. The Connecticut Legislature authorizes a voter to retain for six months, for the purpose of voting, residence in the town from which he moved, and meanwhile he is regarded as a resident of the town to which he removes, for the purpose of becoming a voter there.

STATE OFFICERS, 1915. Governor, Marcus H. Holcomb; Lieutenant-Governor, Clifford B. Wilson; Secretary of State, Charles D. Burnes; Treasurer, Frederick S. Chamberlain; Comptroller, Morris C. Webster; Attorney-General, George E. Hinman; Adjutant-General, Brig.-Gen. George M. Cole; Commissioner of Insurance, Burton Mansfield—all Republicans.

JUDICIARY. Supreme Court: Chief Justice, Samuel O. Prentice; Associate Justices, George W. Wheeler, John M. Thayer, Alberto T. Roraback, John K. Beach; Clerk, Geo. A. Conant.

STATE LEGISLATURE:

	Senate	House	Joint Ballot
Republicans	30	197	227
Democrats	5	60	65
Republican majority..	25	137	162

CONRAD, JOSEPH. See LITERATURE, ENGLISH AND AMERICAN, *Fiction*.

CONSERVATION. See DRAINAGE; FORESTRY; IRRIGATION; LANDS, PUBLIC.

CONSERVATION OF FOOD. See AGRICULTURE.

CONSTANTINE, KING OF GREECE. See GREECE, *History, passim*.

CONSULAR SERVICE. See CIVIL SERVICE.

CONSUMPTION. See TUBERCULOSIS.

CONTAGIOUS DISEASES. See VITAL STATISTICS.

CONTINENTAL ARMY. See MILITARY PROGRESS.

CONTRABAND. See UNITED STATES AND THE WAR.

COPPER. The smelted production of copper in 1914 showed a considerable decrease from that of 1913. This was due to the unfavorable market conditions, brought about by the European war, and prevailing during the last five months of the year. The refinery production also showed a reduction due to the same causes.

The total production by smelters from copper-bearing materials in 1914 was 1,150,137,192 pounds, valued at \$152,968,246, compared with 1,224,484,098 pounds valued at \$189,795,035 in 1913. The mine production in 1914 was 1,148,431,437 pounds. Copper was mined in 22 States and Territories during the year. The four leading States are Arizona, Montana, Utah, and Michigan, producing 82 per cent of the total output in 1914. Montana, Michigan, and Arizona are the three great copper producing States. Montana ranks first, with nearly one-third of the entire output of the country; Michigan ranks second with more than 28 per cent; and Arizona third, with more than one-fifth.

The following table gives the production of copper in the various States in 1913-14.

State	1913	1914
Alaska	23,428,070	24,985,847
Arizona	404,278,809	382,449,922
California	82,492,265	29,784,173
Colorado	9,052,104	7,316,066
Idaho	8,711,490	5,875,205
Michigan	155,715,286	158,009,748
Montana	285,719,918	236,805,845
New Mexico	50,196,881	64,204,703
Nevada	85,209,536	60,122,904
Oregon	77,812	5,699
South Dakota	4,549	
Utah	148,057,450	160,589,660
Washington	732,742	688,602
Wyoming	862,285	17,082
Eastern States and unapportioned	20,449,951	19,286,836
Total	1,224,484,098	1,150,137,192

The exports of metallic copper from the United States amounted to 840,080,922 pounds, valued at \$117,633,145. The imports amounted to 306,350,827 pounds. See METALLURGY.

COPYRIGHT. According to the report of the register of copyrights for the fiscal year 1914-15 the registrations numbered 115,193, as compared with 123,154 for the preceding year. Of the registrations for 1915, 104,420 were for \$1 each, including a certificate, and 9447 were for photography without certificates. The registrations included chiefly books, periodicals, dramatic and musical compositions, works of art and reproductions thereof, photographs, and prints. There were 1326 registrations of renewals. The applied fees for the year were \$111,922.75, more than double those for 1897-98. The copyright registrations are indexed upon cards. The temporary cards made for the indexes to the printed catalogue, numbering 87,227 during 1914-15, have been eliminated and the remaining cards, 107,337 for the fiscal year, were added to the permanent card indexes, now numbering over 2,825,000 cards.

There was no new copyright legislation in 1915. Several bills were introduced, but they failed to pass. Conspicuous among these was the Levy Bill for depriving publishers or authors of the secondary meaning right in material on which copyright had expired. The secondary meaning right is practically the trade right in the title of a work, and is somewhat of the nature of a trade mark right. There was a large amount of moving picture litigation, but it was not conclusive, as final decisions were not handed down by the Supreme Court of the United States. The whole question of moving picture rights and their relation to dramatic rights is yet to be settled. There are two contentions: (1) moving picture and dramatic rights are identical; (2)

they are separate and distinct. These two contentions are yet judicially undecided; but the indications of recent cases before the courts are in favor of the second. The copyright amendment act of 1912 recognizes the distinction between moving picture and dramatic rights; but this lacks the force of a judicial pronouncement. So far as the litigation is concerned the bigger feature productions are conspicuous by reason of the large amounts of money involved.

In the early part of the Congressional session, Senator Penrose introduced a bill to provide for copyright protection for motion picture scenarios. These were not copyrightable hitherto any more than book or short story manuscripts. They are protected under the common law rights of literary property; but a great many scenario writers have been agitating for copyright protection. Expert opinion on the subject seems to be that one decided benefit of this protection would be the record of the date when the author had the completed manuscript in his possession. In an infringement suit it is important, if not essential, to prove the priority of the plaintiff's material over that of the alleged infringer. The Authors' League of America has made an attempt to assist authors in providing proof of such priority by establishing a registration bureau where members and non-members, upon complying with the rules, may register their scenarios. They receive a receipt card, bearing the date of the deposit, title, author's name, number, etc.; and a record of the deposit is made in the books of the Authors' League.

The convention on literary and artistic property signed at Buenos Aires, on August 11, 1910, was between the United States and 19 Central and South American governments. On July 13, 1914, the President of the United States proclaimed this convention as effective between the United States and the Dominican Republic, Ecuador, Guatemala, Honduras, Nicaragua, and Panama. Bolivia has recently signified its adherence to the convention.

A British order-in-council was signed on Feb. 3, 1915, to protect within the British dominions, excepting Canada, Newfoundland, Australia, New Zealand, and South Africa, the unpublished works of the citizens of the United States. It ordered that the British Copyright Act of 1911 should apply from Jan. 1, 1915; but that enjoyment of rights conferred by the order should be subject to the accomplishment of conditions and formalities prescribed by the laws of the United States. The order was made upon the understanding that a proclamation would be issued by the President of the United States extending certain copyright protection to the subjects of Great Britain.

CORAL REEFS. See GEOLOGY.

CORN. Data pertaining to the world's corn crop of 1915 were much less complete than those regarding the crops of preceding years. For the calendar year 1915 the world's production was estimated at 3,921,000,000 bushels, including the harvest of the Northern Hemisphere, which constitutes from 93 to 94 per cent of the world's corn crop, together with the yield of the Southern Hemisphere which was harvested early in the year. The crop in the principal corn-producing countries of the Southern Hemisphere to be harvested early in 1916 was reported as promising a satisfactory yield. The 1915 production in the Northern Hemisphere according to an es-

timate of the International Institute of Agriculture based on returns received from most of the principal corn growing countries north of the equator was placed at 3,596,000,000 bushels, this output being greater by about 14 per cent than the total of the yields in 1914 for the countries concerned. A calculation based on the records of the world's corn consumption for the preceding five years pointed out that the world's requirements for 1915-16 could be met adequately by the visible supply made up of the new crop harvested and the quantities carried over from the preceding year. The quantity of corn from the crop of the preceding year on hand in the United States on Nov. 1, 1915, was estimated at almost 90,000,000 bushels, or about 50 per cent more than on Nov. 1, 1914. The average annual value of corn and corn meal carried in international trade is placed at \$210,000,000.

The 1915 corn crop of the United States as estimated by the Department of Agriculture amounted to 3,054,535,000 bushels, second in quantity only to the crop of 1912. The crop area was 108,321,000 acres which was surpassed by the acreage of 1909. The average yield per acre, 28.2 bushels, had been reached and surpassed a number of times. The total value of the crop based on the average price of 57.5 cents per bushel to farmers on December 1st of the year was placed at \$1,755,859,000, a total value that had never been reached and which stood over \$33,500,000 above the total value of the preceding year which ranked next. While the crop of 1915 ranked high in production and cash value it was considered doubtful that its feeding value was as great as that of the crop of 1914. Weather conditions were unfavorable and the quality of the crop was much reduced. Low temperature in August together with a high rainfall during the growing season in a considerable portion of the corn belt retarded the growth of the crop, and frosts early in October which in a normal year would have done no harm injured the immature corn and prevented the proper ripening of a large percentage of the crop. These conditions were most pronounced in Iowa and the northern part of Illinois. The earlier varieties generally planted in Minnesota and Wisconsin proved an advantage to these States, and the season was also more favorable in Nebraska and Kansas, where enough but less rain fell than in Iowa and parts of Illinois. A large percentage of the ears in these sections were light and soft, which led to an early feeding of stock in order to use as much as possible of the soft corn before spoiling. As a result there was a much heavier market movement of cattle and hogs early in the season than is usual under ordinary conditions. The immaturity of the crop also made seed corn selection difficult and in some localities corn of the previous year was retained for seed. Owing to the condition of the crop it was estimated that more silage was put up in 1915 than would otherwise have been the case. It is of interest to mention here that an inquiry made by the Department of Agriculture indicated that about 8 per cent of the corn acreage of 1914 was cut for silos, 11 per cent cut green for feed, and 81 per cent was matured for the grain; or, applied to the acreage, about 8,364,000 acres were used for silage, 11,282,000 cut for green feed, and 83,789,000 allowed to mature. It was fur-

ther reported that in the New England States more than half the crop is cut for silage; in Wisconsin, 36 per cent for silage and 18 per cent for green feed; Michigan, 28 per cent for silage and 13 per cent for green feed; and Illinois, 9 and 10 per cent respectively. The States leading in grain production in 1915 and their yields were as follows: Illinois, 376,164,000; Iowa, 303,000,000; Nebraska, 213,000,000; Missouri, 209,450,000; Indiana, 190,950,000; Texas, 175,075,000; and Kansas, 172,050,000 bushels. The highest average yield per acre, 50 bushels, was reported for Connecticut. The production of Canada was placed at 14,594,000 bushels from 253,300 acres, or at the rate of 57.62 bushels per acre.

CORNELL UNIVERSITY. An institution for higher education, founded in 1865 at Ithaca, N. Y. The total enrollment in all departments on Nov. 1, 1915, exclusive of duplicates, was 5392. There were 750 members of the faculty. Notable gifts received by the university during 1915 were the following: \$150,000 from George F. Bailey of New York City for a residential hall; \$20,000 from an unnamed donor for the university dining halls; \$7500 from the executors of the Fiske Estate, an addition to the Library Endowment Fund; \$6000 from J. G. White, an engineering contractor of New York City, for the endowment of prizes in Spanish; \$3000 from Hiram W. Sibley for additional equipment for Sibley College; \$3800 for the Luana L. Messenger Prize fund, under the will of Hiram John Messenger, of the class of 1880. The donations received by the university amounted in all to \$202,632. The productive funds at the end of the fiscal year of 1915 amounted to \$14,057,115, and the annual income for the fiscal year, to \$1,644,516. The library contained 455,129 volumes.

CORPORATION, AMERICAN INTERNATIONAL. See FINANCIAL REVIEW.

CORPORATIONS. See TRUSTS and TAXATION.

CORPORATION TAX. See TAXATION.

CORRECTION. For matters connected with this subject, see CHARITIES.

COSTA, AFONSO. A Portuguese statesman, died July, 1915. He was for many years one of the strongest political leaders in Portugal, and at various times premier, minister of finance, and minister of justice. He was the author of the law providing for the separation of the Church and State in Portugal. An advocate of revolution, he was several times sent to exile for attempted uprisings, and was imprisoned as ringleader of the attempted revolution in January, 1908.

COSTA RICA. A Central American republic situated between Nicaragua and Panama and bordering both the Caribbean and the Pacific coast. Capital, San José.

AREA, POPULATION, ETC. The area is estimated at 48,110 square kilometers (18,691 square miles). The estimated population in 1884 was 195,906; at the end of 1912, 399,424; 1913, 410,981; 1914, 420,179. Births in 1913 and 1914, 17,746 and 18,633; deaths, 9382 and 9482. The population of San José at the end of 1913 was stated at 33,900; Heredia, 8000; Cartago, 7000; Limón, 7000; Alajuela, 6260; Puntarenas, 4850. The white population dwells largely in these towns. In 1913 there were 414 public elementary schools, with 1306 teachers,

33,084 pupils, and an average attendance of 28,690. There are a few secondary schools and faculties for professional education. The state religion is Roman Catholicism.

PRODUCTION AND COMMERCE. According to figures published in 1915 by the Pan-American Union, there were in 1914, 323,680 hectares under cultivation, of which 28,681 hectares in coffee, 24,127 in bananas, 11,928 in sugar cane, and 2604 in cacao. Other important crops are corn, beans, potatoes, and rice. Cattle raising is a profitable industry, especially in the west and in the districts adjoining Nicaragua. The number of cattle reported in 1915 is 337,061. Horses number about 60,000. Gold and silver are mined.

Imports and exports have been valued as follows, in thousands of colones:

	1910	1911	1912	1913	1914
Imports	16,984	19,080	21,676	18,678	16,240
Exports	18,009	19,192	21,428	22,197	28,359

The principal imports are cotton goods, structural iron and steel and railway material, coal, flour, and lard. The bulk of the exports consist of bananas and coffee. In 1912, 10,647,702 bunches of bananas were exported; in 1913, 11,170,812 (of which, to the United States, 8,352,722, and to the United Kingdom, 2,713,111). The coffee export in the crop year ended Sept. 30, 1912, was 12,238 metric tons; in 1913, 13,019 (of which 82 per cent to the United States). The banana and coffee exports in 1912 were valued at 10,647,702 and 7,623,561 colones respectively; in 1913, 11,170,812 and 7,752,750; in 1914, 10,163,000 and 10,029,000. Other export values in 1914: Gold and silver, 1,443,000 colones; woods, 268,000; hides, 256,000; cacao, 181,000; rubber, 26,000. Imports from and exports to the United States in 1914, 8,650,000 and 10,523,000 colones respectively; United Kingdom, 2,341,000 and 11,166,000; Germany, 2,291,000 and 1,014,000; France, 646,000 and 266,000. In 1914 there were entered at Limón 438 vessels, of 967,668 tons; at Puntarenas, 80, of 185,646 tons.

COMMUNICATIONS. In 1914 Costa Rica had in operation 687 kilometers (431 miles) of railway, including branches and sidings, all of 3-foot 6-inch gauge. Of this mileage 69 miles (111 kilometers) is the property of the government, 141 miles (227 kilometers) belong to the Northern Railway Co., and 217 miles (349 kilometers) to the Costa Rica Railway. The Costa Rica Railway, however, is leased to the Northern, so that the whole system of some 358 miles (576 kilometers), having its focal point at Limón, is under one general management. Both these roads are well constructed, with steel and iron bridges, suitable stations, and sidetracks, and are maintained in good condition. Various branch lines have been extended up and down the coast for the service of the banana industry. The main line leaves Limón, passing through Matina, Siquirres, Turrialba, and Cartago, and reaching San José, at a distance of 103 miles (166 kilometers). The system is continued to Alahuela, 14 miles (23 kilometers) north of San José.

The Pacific Railway extends from San José to Puntarenas, on the Pacific coast, a distance of 69 miles (111 kilometers). The connecting link between Cascajal and El Roble, a distance of 12

miles (20 kilometers), was completed in 1910.

Telegraphs in 1914: Offices, 126, with 2447 kilometers of wire. A radiotelegraph station is in operation at Limón. Post offices, 204.

FINANCE. The standard of value is gold. The monetary unit is the colon, whose par value is 46.536 cents. Revenue and expenditure have been as follows, in colones:

	1911	1912	1913	1914
Revenue	9,707,269	9,950,672	9,612,534	8,601,690
Expend.	9,801,956	9,810,719	10,184,261	9,747,246

The budget for 1915 showed estimated revenue of 9,662,000 colones; estimated expenditure, 9,661,089. The largest estimated receipts were: Customs, 5,600,000 colones; liquor tax, 2,438,000. The largest expenditures are for the public debt, public instruction, and war and police. Public debt, Dec. 31, 1914, £1,586,660 and 30,000,000 francs.

GOVERNMENT. The President is elected for four years by indirect vote and is ineligible for the succeeding term. He is assisted by a Cabinet of six members. The Congress consists of a single chamber of 43 deputies, also elected indirectly. President in 1915, for the term beginning May 8, 1914, Alfredo González Flores. Vice-President, Domingo González.

HISTORY. Foreign Relations. The republic of Panama early in January repudiated the award of Chief Justice White of the United States Supreme Court on the question of the boundary between Panama and Costa Rica. The award was made under the Porras-Anderson convention of March 10, 1910. Late in January the United States began to negotiate a treaty to compensate Costa Rica for its rights in the interoceanic canal route in Nicaragua over which the United States is trying to gain control. It is understood that the United States will pay \$1,500,000 for an option on Costa Rica's rights. The United States has maintained since President Taft first broached the idea that the San Juan River, which would form the first part of the canal across Nicaragua, is one of the natural boundaries of Costa Rica, and, according to the protocols to which Nicaragua pledged itself at the time that the boundary line was fixed, Costa Rica must be consulted before any rights are surrendered. In August the government made arrangements with the Bankers Trust Company and the Irving National Bank, both of New York City, to open a credit account for nine months, such funds to be used exclusively for the payment of merchandise imported or to be imported into Uruguay. This arrangement was the first practical result of the Pan-American Financial Congress.

Internal Conditions. Early in May the government passed a law affording protection against injury to workmen in factories, shops, industrial establishments, mines, smelters, buildings, excavations, and agricultural industries. Señor Julio Acosta García was made secretary of foreign relations in July to succeed Señor Manuel Castro Quesada, who resigned to become minister to Washington. See INTERNATIONAL PEACE AND ARBITRATION.

COST OF LIVING. See PRICES.

COTTON. The cotton crop of the United States for 1915 was about 69 per cent of the record crop of 1914, when 16,134,930 bales of

500 pounds each were produced. On Dec. 10, 1915, the Bureau of Crop Estimates of the United States Department of Agriculture estimated the crop for 1915 at 11,161,000 bales, exclusive of linters, as compared with a five-year average (1909-13) of 13,033,235 bales. Shepperson's estimate of the crop of 1915 for the United States is 11,750,000 bales, including linters. The area planted to cotton in 1915 was 31,535,000 acres, or 15.7 per cent less than in 1914. The principal reason for the greatly reduced production was the demoralized condition of the cotton market following the outbreak of the war in Europe. The average price of cotton on Dec. 1, 1914, was only 6.8 cents per pound, and the seed brought about \$4.50 per ton less than the previous year. These conditions were quite general and resulted in a reduced planting in nearly all the important cotton-growing countries. The United States Bureau of the Census reported 10,643,783 running bales as already ginned to the end of 1915. This total includes 105,779 round bales and 88,921 bales of Sea Island cotton which, on account of their lighter weight, are counted as half bales. The Sea Island crop, which will probably nearly equal that of 1914, was ginned as follows: Florida, 27,803; Georgia, 55,531; and South Carolina, 5587 bales.

According to the United States Consular Reports, the Egyptian crop on Nov. 19, 1915, was estimated at 967,750 bales of 500 pounds. From the same source, a greatly reduced area planted to cotton in India is reported. The Russian crop was estimated to be 1,228,000 bales of 500 pounds each. An estimated crop of 2800 bales is reported in Japan.

The crop of the United States for 1914, the estimated crop for 1915, and the amount reported ginned to the end of 1915, exclusive of linters, by States were:

States	Crop, 1914 500 pound bales	Estimated crop, 1915 500 pound bales	Reported ginned, Jan. 1, 1916 Running bales
United States ..	16,134,930	11,161,000	10,643,783
Alabama	1,751,375	1,050,000	1,007,408
Arkansas	1,016,170	785,000	754,442
Florida	81,255	50,000	54,775
Georgia	2,718,037	1,900,000	1,907,098
Louisiana	449,458	360,000	322,575
Mississippi	1,245,535	940,000	800,646
North Carolina ..	930,631	708,000	697,072
Oklahoma	1,262,176	630,000	561,482
South Carolina ..	1,533,810	1,160,000	1,134,059
Tennessee	383,517	295,000	281,893
Texas	4,592,112	3,175,000	2,938,622
All other States ..	170,854	108,000	84,711

Of the States listed as "all others," Missouri in 1914 produced 81,752; Virginia, 25,222; and California, 49,835 bales. In 1915 these States are estimated to produce 52,000, 16,000, and 34,000 bales respectively. The crop of Arizona, where locally produced strains of Egyptian cotton are grown, was not expected to much exceed 2000 bales, owing to reduced acreage and unfavorable weather conditions at the beginning and end of the crop year.

The cotton crop of the United States for 1914, as finally reported by the Bureau of the Census, was 16,134,930 gross bales of 500 pounds each, of which 81,654 bales were Sea Island, the remainder various types of upland cotton. In addition there were produced 856,900 bales of linters, and 7,186,000 tons of seed, of which 5,-

779,665 tons were crushed for oil, cake, etc. The total value of the 1914 crop of the United States was \$720,080,000, as compared with \$1,026,700,000 for 1913. The Sea Island cotton production in 1914 was somewhat larger than the two preceding crops, and, from the preliminary announcements, that for 1915 will not show as great a reduction as the upland crop.

By agreement between cotton exchanges and statistical bodies at home and abroad, the cotton statistical year has been changed to end with July 31st, instead of August 31st, as formerly. On this account, data for different years are not strictly comparable.

The world's production of commercial cotton in 1914, that is the amount available for mill purposes, was approximately 24,764,000 bales of 500 pounds net weight, an increase of more than 2,500,000 bales over that of 1913. The contributions of the leading countries to the world's mill supply of cotton for 1913 and 1914, according to the United States Bureau of the Census Bulletin 131, were:

Country	1914	1913
	500 pound bales	500 pound bales
United States	15,433,000	13,545,000
India	8,326,000	8,692,000
Egypt	1,384,000	1,496,000
China	1,750,000	1,200,000
Russia	1,126,000	1,030,000
Brazil	440,000	420,000
Mexico	125,000	150,000
Peru	103,000	110,000
Persia	127,000	140,000
Turkey	120,000	130,000
All other countries....	825,000	285,000
Total	24,764,000	22,198,000

Reduced to percentages, the contributions of the leading countries to the mill supply in 1914 were: United States, 62.3; India, 15.4; China, 7.1; Egypt, 5.6; and Russia, 4.6 per cent.

The world's consumption of cotton for 1914-15 is estimated by the Bureau of the Census as 19,761,000 bales of 500 pounds net weight, of which the United States took 5,429,000, the United Kingdom 3,890,000, and Continental Europe 625,000 bales. In the United States, the cotton-growing States took 2,938,000 bales and the other States 2,491,000 bales. There were 141,500,000 active and idle spindles in the world in 1915, of which there were in the United States during November, 31,497,435 active spindles. There were located in the cotton-growing States at that time 12,801,204 active spindles, and in the other States, 18,696,231.

The estimated cotton supply of the United States for the year ending July 31, 1915, was 17,891,154 bales. Of this amount, there were exported, 8,322,688 bales; consumed by mills, 5,597,362 bales; and destroyed by fire, 35,000 bales, leaving 3,936,104 bales on hand at the end of the crop year. The greatest consumption of cotton in the United States was in Massachusetts, where 1,282,937 bales were used, with North Carolina second, taking 910,154 bales. The imports of cotton to this country for the year ending July 31, 1915, were 382,286 bales, the most of which was Egyptian cotton used for mercerizing and in the manufacture of thread, knit goods, and laces. During the same period 10,353 bales were imported from Peru, nearly all of which was rough Peruvian used for mixing with wool. The reexports were 18,691

bales, making the net importations 363,595 bales.

Detailed information regarding the crop of 1915 is meagre except for the United States. In India a reduction of about 22 per cent in the area planted is reported. An attempt is being made by the government and various coöperating agencies to improve the quality and yield of the Indian crop through the distribution of better seed and by demonstration experiments in many localities. In Egypt legislative restrictions resulted in the planting of about 1,230,000 acres, a reduction of over 400,000 acres. The pink bollworm is reported to have caused considerable loss in some localities. The Russian crop is reported as being quite satisfactory, increased plantings having been made in most of the larger producing provinces. The West Indian production does not appear to be increasing and it is quite possible that the crop of 1915 will show a reduction. In Africa, the purchases of the British Cotton Growing Association were less than in 1914. The purchases in Lagos to Sept. 30, 1915, were 5974 bales, as compared with 13,486 in the previous year. Nyassaland reports an increase in the value of exports amounting to \$32,816. The Uganda crop of 1914 was 21,428 bales, and the estimated crop in the Sudan for 1915 is placed at 24,000 bales. Production in Northern Nigeria has fallen off, only 497 bales having been purchased to the end of September, 1915. It has been decided to suspend the operations of the Association in the Gold Coast, Illushi, and Southern Nigeria. Successful efforts have been made to grow Egyptian cotton in Greece, especially in Messina and Thessaly. A rather extensive experiment in growing American upland cotton has been begun in Sicily. In Brazil, there has been organized a Cotton Service as a branch of the Ministry of Agriculture, and Dr. E. C. Green, for some years with the United States Department of Agriculture, has been placed in charge of the work. In Grenada, the destruction by fire of all cotton plants before the beginning of the next cotton season is required by recent enactment, on account of the presence of various pests.

The United States Department of Agriculture and the agricultural experiment stations throughout the cotton-producing section are continuing their efforts to bring about larger average yields and a better quality of staple, and some very suggestive results have been obtained. The new single-stalk system of cotton culture is said to be giving increased yields of from 40 to 121 per cent, as compared with common methods. The Durango cotton, which has been recently acclimatized from Mexico, is proving its superiority over other cottons in the Southwest, and recent investigations have shown its earlier character and other desirable qualities over Columbia for eastern cultivation. Through coöperative agreement between the Department of Agriculture and the experiment stations of South Carolina, Alabama, and Georgia, seed of valuable varieties of cotton resistant to root knot is being grown for distribution for 1916 planting. From extensive observations, it has been learned that run of the gin seed should not be used for planting where it is desired to perpetuate any particular variety of cotton.

The cotton boll weevil advance into new territory has been greater than for several years.

The average advance has been at the rate of about 50 miles per year, but in 1915 it spread in a northeasterly direction more than 100 miles, and it has finally reached the region of Sea Island cotton production. Most of the advance took place in the period from August 15th to August 31st, when a series of high winds prevailed. The pest was reported in Georgia in 1915 for the first time, 25 counties being infested. In Florida, 8 additional counties and 20 additional ones in Alabama were invaded. Owing to favorable weather conditions, boll weevils were more numerous in Texas in 1915 than for several years. On account of the discovery of living larvæ of the pink bollworm (*Gelechia gossypiella*) in cotton from Egypt, and the known occurrence of this and other pests in various countries, a quarantine has been established against the admission of cotton or cotton seed except under limitations. The shipment of cotton samples through the mails has been prohibited. After Feb. 1, 1916, the fumigation of all imported cotton will be required.

COTTON FUTURES ACT. The newly established Office of Markets and Rural Organization of the United States Department of Agriculture is charged with the administration of the Cotton Futures Act and various investigations arising under it. This law, known also as the Smith-Lever Law, was passed in August, 1914, and became effective February 18, 1915. While its operation included all cotton exchanges it was aimed primarily at the New York Cotton Exchange. It was the culmination of several years of agitation which became of public interest in 1907, when Congress requested the Commissioner of Corporations, Herbert Knox Smith, to investigate the causes of fluctuations in the prices of cotton and differences in the values of various grades. During the four years 1909-13 members of the New York Exchange had vigorously opposed the growing sentiment in Congress in favor of regulation; but in 1915 their attitude changed rather decisively so that even preceding the passage of the Smith-Lever Law they had decided to adopt government standards and monthly revision of grade differences. This action by the Exchange was taken November 17th and became effective on contracts maturing on and after April 1, 1915. The Cotton Futures Act imposed a tax of two cents per pound on all cotton sold on any exchange which did not conform to two essential conditions: (1) the cotton dealt in must be graded according to official standards of the Department of Agriculture; and (2) the relative difference in the value of various grades must be determined by averaging the quotations of actual transactions in each grade in various markets. The law further specified in detail certain requirements as to certificates of sale. An especially noteworthy provision was a tax of two cents a pound on all cablegrams to foreign exchanges unless such exchanges conformed as regards standard grades and rules of operation to the requirements of the law. This tax virtually prohibited transactions by Americans on the exchanges at Liverpool, Havre, and Bremen. The constitutionality of the law was contested in the Federal District Court at New York, with the result that on October 13th Judge Hough declared it unconstitutional. His contention was that the act was a revenue measure and hence should have originated in the House,

whereas it was first presented in the Senate. The government contended that it was not intended as a revenue act, and further that the tax features, which were purely incidental to the regulations which the act sought to impose, were added as an amendment in the House. Notice of appeal was given, as also notice that pending decision by the Supreme Court the act would be strictly enforced. The preparation and distribution of the new official standards of cotton for the United States, provided in the Futures Act, have been actively pursued, and 380 sets were distributed to June 30, 1915. The New York and New Orleans cotton exchanges adopted these standards for all transactions subsequent to Feb. 18, 1915. By June 30, 1915, 21 other organizations were using them.

COTTON SUBSTITUTES. See **CHEMISTRY, INDUSTRIAL.**

COURT TENNIS. See **RACQUETS AND COURT TENNIS.**

COWS. See **DAIRYING; STOCK RAISING AND MEAT PRODUCTION.**

CRANE, WALTER. English painter, designer, illustrator, and writer, died March 15, 1915. Born in 1845, he was privately educated. He served an apprenticeship with W. D. Linton, and in 1863 illustrated for his first book, *The New Forest*. He had previously exhibited in the Royal Academy. His talents as an illustrator and painter won him quick recognition, and from 1882 to 1886, when he resigned, he was a member of the Royal Society of oils and water color. He received numerous medals for illustrations, designs, and rural work. He illustrated many well-known children's books as well as several of Shakespeare's plays, and he designed the panels for the Women's Temperance Union building in Chicago, and the friezes for the gallery of the British Art Section at the St. Louis World's Fair. In addition to his work as an artist, he was an aggressive Socialist. Among his writings are: *An Artist's Reminiscences* (1907); *Indian Impressions* (1907); and *William Morris and Whistler* (1911). His work is represented in the principal galleries of London and elsewhere.

CREDIT. See **AGRICULTURAL CREDIT; and BANKS AND BANKING.**

CREDIT BANKS. See **AGRICULTURAL CREDIT.**

CREDIT UNIONS. See **AGRICULTURAL CREDIT; and AGRICULTURAL LEGISLATION.**

CREELMAN, JAMES. American editor and journalist, died Feb. 12, 1915. He was born in Montreal, Canada, in 1859, and was educated in the Canadian schools and at Talmage's Lay Theological College. In 1857 he became a member of the staff of the *New York Herald*, and acted as reporter, correspondent, and editorial writer for that paper. He was the editor of the London edition in 1890, and of the Paris edition 1891-92. In 1893 he was British editor of the *Cosmopolitan Magazine*. He acted as a correspondent for the *New York World* in the Japanese War of 1894. For the *New York Journal* he reported the Græco-Turkish War, 1897, the Cuban War, 1898, and the war in the Philippines in 1899, where he was severely wounded. In 1900-06 he did editorial work for the *New York Journal* and the *New York World*, and in 1906-10 was associate editor of *Pearson's Magazine*. He was appointed president of the Municipal Civil Service Commission of

New York City in 1911-12. In the latter year he became associate editor of the *New York Evening Mail*. He was a member of many societies, and wrote: *On the Great Highway* (1901); *Eagle Blood* (1902); *Why We Love Lincoln* (1908); and *Diaz, Master of Mexico* (1911).

CRETE (CANDIA). An island in the Mediterranean Sea; an autonomous state under the suzerainty of Turkey until May 31, 1913, when it was ceded to the Balkan powers, which formally recognized its union with Greece by the treaty of Bucharest, Aug. 10, 1913. Area, 3327 square miles; population (census of April 17, 1911), 344,001. Canea, the capital, has 25,185 inhabitants. Greek is the language of the people, a large majority of whom are Christians. The chief products for export are wheat and fruit, wool, soap, olive oil, carobs, vellonea, and cheese. The trade (mostly with Greece and Turkey) amounted in 1910 to 19,650,000 drachmas imports and 17,477,000 drachmas exports; in 1911, 21,359,000 and 15,631,000. Revenue and expenditure in 1910, 6,465,760 and 7,308,632 drachmas; in 1911, 6,518,594 and 6,792,829. Debt in 1912, 4,615,709 drachmas. A Governor-General (Loukas Roufos Kanakaris) was appointed Oct. 12, 1914.

CRICKET. The European war for the second year in succession prevented any international cricket matches. The sport in the United States, however, gained greatly in popularity. The Germantown Club carried off the honors by capturing the Halifax Cup after a close struggle with the New York team, which for the first time was a competitor. F. Greene of the Germantown Club won the Childs Bowling Cup with a record of 28 wickets at an average of 11.71. The Childs Batting Cup went to B. Kortlang of New York with an average of 65.16 for eight innings.

The Metropolitan League pennant was captured by the Manhattan Club which scored 10 victories in as many matches. L. Miller of the Manhattans won the league batting prize, his average being 44, and F. S. Hall of the same club proved to be the best league bowler. Bensonhurst took the championship of the New York and New Jersey Cricket Association, conquering Manor Field in the last contest of the season. The batting crown of the association went to R. Comacho of Manor Field and the bowling laurels to H. B. H. Boyce of Bensonhurst.

The death of William Gilbert Grace, known throughout the world as the king of cricket, occurred during the year.

CRIME. See **PENOLOGY.**

CRIMINOLOGY. See **PENOLOGY.**

CRITICISM. See **LITERATURE.**

CROATIA AND SLAVONIA. See **AUSTRIA-HUNGARY.**

CROFFUT, WILLIAM AUGUSTUS. American author, died July 31, 1915. He was born in Reading, Conn., in 1835; was educated in the common schools; and in 1852 engaged in newspaper work, leaving this to enlist in the Union army, in which he served throughout the Civil War. At its close he became a reporter and correspondent for newspapers. At different times he was editor of the *Minneapolis Tribune*, the *New York American*, and other papers. From 1888-94 he was executive officer of the United States Geological Survey. He organized and became secretary of the Anti-Imperialistic

League in 1899. He was the author of many books, including: *War History of Connecticut*, *The Open Door of Dreamland*, *Fifty Years in Camp and Field*, and the *Crimson Wall*, a novel. He also published several volumes of verse, and wrote the *Opening Ode* for the Chicago Exposition in 1893.

CROPS. See article AGRICULTURE, and section *Agriculture* under various countries and States of the United States.

CROSBY, FRANCES JANE VAN ALSTYNE, better known as "Fanny" Crosby. American hymn writer, died Feb. 12, 1915. She was born at Southeast, N. Y., in 1820. When she was six years of age she became blind from an illness. Some years later she entered an institution for the blind in New York City, and was a teacher of English grammar, rhetoric, and literature in that institution from 1847-58. She wrote the words for many songs of George F. Root. Her first hymn was written for William B. Bradbury. She wrote in all more than 6000 hymns, several of which are well known. She also wrote secular songs, including *There's Music in the Air*, and *Hazel Dell*, and was the author of the *Blind Girl and Other Poems* (1844), *Monterey and Other Poems* (1849), *Bells at Evening and Other Poems* (1898), and *Memories of Eighty Years* (1906).

CROSS COUNTRY RUNNING. See ATHLETICS, TRACK and FIELD.

CROWN PRINCE WILHELM, INTERNMENT OF. See UNITED STATES and the WAR.

CRUISERS. See BATTLESHIPS; and NAVAL PROGRESS.

CRUSTACEA. See ZOÖLOGY.

CUBA. An island republic of the West Indies. The capital is Havana.

AREA, POPULATION, ETC. The following table shows the area by provinces and the population according to the census of Sept. 30, 1907, and the estimate of June, 1913:

	Square miles	Population 1907	1913
Pinar del Río.....	5,164	240,372	257,898
Havana	2,772	538,010	651,266
Matanzas	3,700	239,812	270,483
Santa Clara	9,560	457,431	567,277
Camagüey	10,500	118,260	154,567
Oriente	12,468	455,086	567,664
Total	44,164	2,048,980	2,469,579

Population according to race in 1907: Native whites, 1,224,539; foreign whites, 203,637; colored, 620,804 (of whom, 274,272 negroes, 334,695 mulattoes, 11,837 Chinese). Immigration during the year ended June 30, 1913, 58,036; 1914, 40,530 (32,576 males, 7954 females); of the total in the latter year, there were 31,821 Spaniards, 2515 Jamaicans, and 1152 North Americans. The larger cities, with population in 1907, are: Havana, 297,159; Santiago de Cuba, 45,470; Matanzas, 36,009; Cienfuegos, 26,616; Cárdenas, 24,280.

According to the 1907 census, about 31 per cent of the population could not read. As reported for 1914, there were 2344 public school houses, with 4333 teachers, and 277,013 pupils enrolled; average attendance, 120,263. The government maintains a secondary school in each province; total students in 1914, about 1500. There is a State university at Havana, with about 1300 students.

PRODUCTION AND COMMERCE. The staple ag-

ricultural products are sugar and tobacco. Other crops are cacao, potatoes and other vegetables, cereals, and fruits, especially pineapples, bananas, oranges, and coconuts. Cuba and British India are the two most important producers of cane sugar in the world. Cuba's production of tobacco is not so great as that of some other countries, but it leads all others in the output of tobacco which is suitable for fine cigars. Stock raising is important. There are large mineral resources, especially in Oriente, including iron, manganese, copper, lead, zinc, gold, and salt.

Imports and exports respectively have been valued as follows in fiscal years ended June 30, 1910, \$163,446,127 and \$144,039,483; in 1911, \$108,098,000 and \$129,179,000; in 1912, \$120,229,317 and \$146,787,295; in 1913, \$135,810,000 and \$165,208,000; in 1914, \$134,008,138 and \$170,796,851. The leading imports include breadstuffs, meats, cotton goods, iron and steel, and machinery. The following table shows the principal exports:

	1911-12	1912-13	1913-14
Sugar, raw...	\$101,542,170	\$110,856,715	\$119,742,942
Tobacco, unmd.	17,895,525	21,649,893	19,007,213
Tobacco, mfd.	18,061,862	18,918,650	18,775,202
Iron ore.....	3,174,648	4,238,321	3,897,159
Cattle hides..	1,654,459	2,382,790	2,530,132
Molasses	1,387,893	1,977,082	2,429,361
Pineapples ..	1,117,709	1,317,687	1,286,503
Bananas	873,092	817,028	1,026,825
Copper ore...	576,870	599,477	865,662
Spirits	554,922	665,478	532,103
Honey	476,407	509,225	517,778
Cacao	294,242	535,077	507,011
Bees' wax...	345,658	346,819	356,630
Sponges	800,273	295,534	308,782

The quantity of raw sugar exported in the fiscal year 1914 is reported at 4,896,430,625 pounds; molasses, 54,734,060 gallons; refined sugar, 38,991,048 pounds; unmanufactured tobacco, 42,784,831 pounds. Trade by countries, in thousands of dollars:

	1912-13	1913-14	1912-13	1913-14
	Imports		Exports	
United States ..	\$71,754	\$71,420	\$182,581	\$186,986
U. Kingdom....	17,411	15,619	15,668	18,245
Spain	10,228	10,588	692	1,100
Germany	9,515	8,276	6,498	4,486
France	8,237	8,257	1,326	2,652
Porto Rico .....	.....	2,988	.....	49
British India...	.....	2,897	.....	2
Belgium .....	.....	2,637	.....	562
Uruguay .....	.....	1,714	.....	343
Canada	1,499	1,665	2,920	2,066
Argentina .....	.....	1,458	.....	972
Norway .....	.....	1,420	.....	927
Total, including other	\$185,810	\$184,008	\$165,208	\$170,797

COMMUNICATIONS. The length of railway in operation in 1913 is stated at 3806 kilometers (2365 miles). Telegraphs in 1912: 215 offices, 8151 kilometers of line, 9952 kilometers of wire. The government operates nine radiotelegraph stations. Post offices in 1912, 574.

FINANCE. Under a law of Nov. 7, 1914, a new coinage was introduced Dec. 1, 1915. The monetary unit is the gold peso of 1.6718 grams (1.5046 grams fine), equivalent to the American dollar. Gold coins minted are the 20, 10, 5, 4, 2, and 1 peso pieces. Silver coins are the 10, 20, and 40 centavo pieces and the peso. Nickel coins are 1, 2, and 5 centavo pieces. Gold coinage is unlimited. The American coinage continues to be a legal tender.

For the fiscal year ended June 30, 1915, the budget showed estimated revenue of \$41,828,580 and estimated expenditure of \$40,262,906. This budget was continued for the ensuing fiscal year. Estimated customs receipts were \$29,100,000; consular dues, \$670,000; receipts from posts and telegraphs, \$1,000,000; direct taxes, \$1,113,000; excise, \$3,600,000; lottery, \$3,200,000; other receipts, \$3,145,580. The larger estimated disbursements: administration (interior), \$11,042,249; public instruction, \$5,196,421; public debt, \$4,457,963; sanitary service, \$4,264,388; finance, \$3,280,318. The actual customs receipts reported for the year 1913-14 were \$27,665,108, as compared with \$28,174,123 in 1912-13 and \$25,508,895 in 1911-12. Public debt, Jan. 1, 1914: Foreign, \$57,420,000; internal, \$10,408,000; total, \$67,828,000.

GOVERNMENT. The executive authority is vested in a President, who, with a Vice-President, is elected by indirect vote for four years. There is a Congress of two houses: the Senate consists of 24 members (four from each province), elected indirectly for eight years; the House of Representatives consists of 83 members, elected by direct vote for four years. The President is assisted by a Cabinet of eight members. On May 20, 1913, Gen. José Miguel Gómez was succeeded as President by Gen. Mario García Menocal for the four-year term. Vice-President, Dr. Enrique José Varona.

HISTORY. *Political Conditions in Cuba.* Early in January members of the lower house of the Cuban Congress brought charges of misappropriation of public funds against Secretary of the Treasury Cancio. The members claimed that the loan which Cuba had negotiated through J. P. Morgan and Co. of New York would amount to \$10,250,000, whereas the loan bill passed by Congress allowed for a total of only \$10,000,000. The legislative branch of the government won a victory over President Menocal early in February when they repassed the Amnesty Bill over the chief executive's veto. The Amnesty Bill provided specially for the release of Gen. Ernesto Asbert, former Governor of Havana Province, convicted in June, 1914, of killing Gen. Armando Riva, chief of the National Police. There were great celebrations throughout Havana when it was known that Asbert would be released. On February 15th—the 17th anniversary of the destruction of the *Maine* in Havana harbor—President Menocal asked Congress for an appropriation of \$23,000 with which to build a commemorative monument to the victims of the disaster. The United States Department of Commerce announced on March 18th that the Cuban decree, promulgated on Nov. 7, 1914, which authorized the granting of a bounty on raw tobacco and on cigars manufactured in Cuba and shipped direct to foreign countries, had not been enforced and would not be put into effect. Señor Enrique Mazas, editor of *La Tribuna*, was arrested in May, charged with having libeled the President of the republic in an article demanding that Menocal resign either as general inspector of the Chaparra Sugar Company or as President of the republic. An executive decree in July extended the budget for 1914-15 for another year, Congress having taken no action on the matter, and another decree in August lengthened for four years the contract between the government and the National Bank of Cuba, at the same time

reducing the bank's commission to one-eighth of 1 per cent.

Foreign Relations. On May 20th, the 13th anniversary of the independence of Cuba, President Wilson sent a congratulatory message to President Menocal of Cuba. The message read: "It gives me great pleasure to extend to your Excellency and to the Cuban people cordial greetings on this anniversary of the independence of Cuba." Cuba appointed on May 21st Señor Octavio A. Zayas, a private banker, to represent the republic at the Pan-American Financial Congress which convened on May 24th. In June the Department of Foreign Relations of the Cuban Republic announced that it proposed to secure the authorization by Congress of the erection of a magnificent legation building in Washington.

CUMBERLAND PRESBYTERIAN CHURCH. The work of this denomination in 1915 steadily progressed, notwithstanding the fact of litigation which resulted in 1913 in the surrender of the Church's publishing house in Nashville to the Presbyterian Church in the United States. The books, plates, and periodicals were saved, and shortly afterward the members of the denomination subscribed \$12,500 to purchase machinery for a new publishing plant. As a result the *Cumberland Presbyterian*, the denomination's weekly journal, was continued, and also the issue of its Sunday school periodicals and literature. There was nothing notable in litigation during 1915. The Church increased in membership. The greatest enterprise before it in that year was the conduct of a campaign for placing a Sunday school library of the denomination's doctrinal books in every Sunday school, and also for the getting of every member of the denomination to possess and read the gift edition of *Why I Am a Cumberland*. The slogan of the Church in 1915 was "Indoctrinate." According to the latest available returns the denomination has 122,000 communicants, 929 ministers, and 1600 churches.

CURACAO. A Dutch West Indian colony, 436 square miles, composed of the islands of Curaçao (212 square miles), Bonaire (Buen Ayre), Aruba, St. Eustatius, and Saba, and part of the Island of St. Martin. Total population, Dec. 31, 1910, 54,469 (24,297 males, 30,172 females); Dec. 31, 1913, 55,183. Export of phosphate in 1911: Curaçao, 3028 cubic meters; Aruba, 27,658 (in 1912, 28,392). Raw gold export in 1911 (Aruba) was valued at 113,115 guilders; in 1912, 84,561. Total imports (1910), 3,162,310 guilders, exports, 1,121,105; 1912, 3,890,123 and 2,425,541. Vessels entered 1912, 1428 of 2,713,000 cubic meters capacity, at Curaçao, and 1745 of 184,000 at ports of other islands. The budget for 1914 showed estimated revenue of 711,234 guilders; expenditure, 1,193,428; subvention, 482,194; for 1915, revenue, 732,079; expenditure, 1,162,669; subvention, 430,590. Dr. Th. I. A. Nuyens was Governor in 1914.

CURRENCY. See BANKS AND BANKING; COINS, VALUE OF; FINANCIAL REVIEW.

CUSHING CASE. See UNITED STATES AND THE WAR.

CYCLING. Frank L. Kramer in 1915 won the professional cycling championship for the 14th consecutive year, riding on the board track at Newark, N. J. Alfred Goulet of Australia tied with Kramer in the season's point total,

but was defeated in two heats of a series of three match races at five miles.

Kramer also distinguished himself by setting many new records for the shorter distances. The showing of the Australasian riders—Goullet, Grenda, McNamara, and Spears—makes it probable that when Kramer does relinquish his crown as cycling king it will be placed on the brow of one of these marvelous wheelmen.

Among the amateur riders, Ernest Ohrt was in a class by himself, winning the championship competition and also making the fastest time ever made by an amateur for the mile, starting from scratch. Ohrt's time was 1 minute, 53½ seconds.

The annual six-day race at Madison Square Garden, New York City, was won by Alfred Grenda of Tasmania and Fred Hill of Boston, Mass., a new world's record of 2770 miles and eight laps being made. Robert McNamara and Robert Spears, both of Australia, finished second. Goullet, who, teamed up with Grenda, captured this event in 1914, was not entered.

CYPRUS. An island in the easternmost basin of the Mediterranean, until 1914 nominally a part of the Ottoman Empire, but ceded for administrative purposes to Great Britain in 1878. In November, 1914, it was annexed by Great Britain. It has an area of 3584 square miles, and its population by districts (1911) is as follows: Nicosia, 81,497; Famagusta, 58,530; Larnaca, 29,737; Limassol, 46,084; Paphos, 38,508; Kyrenia, 19,752; total, 274,108. Estimated population at the end of 1913, about 287,000. Mohammedans form about 25.9 per cent of the population, the remainder being nearly all Christians of the native Cypriote Church. Nicosia, the capital, had, in 1911, 16,052 inhabitants. Elementary schools of all classes, in 1914, 610 (414 Christian, 196 Mohammedan), with 739 teachers and an enrollment of 33,805 (27,685 Christians and 6120 Mohammedans).

Agriculture, the chief industry, has been greatly retarded by reason of the lack of water; the rivers, nearly all mountain torrents, dry up in summer, and the rainfall is deficient. A plan for storing water for irrigation is in process of realization. The large numbers of goats, together with frequent forest fires, are a hindrance to the development of valuable forests. Cereals, carobs, the famous Cyprus wine, cheese, fruit, vegetables, and live stock are exported. In 1913 there were about 67,700 horses, mules, and asses; 60,500 cattle; 265,500 sheep; 255,200 goats; and 37,000 swine. The imports in 1913 were valued, exclusive of specie, at £619,338 (from Great Britain, £171,712; from British colonies, £6196; from other countries, £441,430); the exports at £620,591 (to Great Britain, £120,713; to British colonies, £6249; to other countries, £493,629). Shipping entered and cleared (1913), 721,515 tons. Revenue (1913-14), £341,816; expenditure, £296,165. A sum of £92,800 was payable annually to Turkey, but this is appropriated to the interest on the guaranteed loan of 1855. British high-commissioner in 1915, Sir John E. Clauson.

HISTORY. In reply to the memorial which the Greek Cypriotes had submitted to the British government in 1914 (see *YEAR BOOK*, 1914) asking for union with Greece, the High Commissioner handed to the Greek archbishop, Cyril, Jan. 4, 1915, a curt acknowledgment of the receipt of the memorial, without the slightest con-

cession to the nationalist aspirations of the petitioners. In delivering this brusque rebuke, the High Commissioner explained orally that the population was not unanimous in desiring affiliation with Greece, and that the Turkish element on the island had actually submitted a petition in favor of the continuance of British rule. Local journals, however, pointed out that the element of the population favorable to British rule constituted but a small minority; and in some quarters it was suggested that a more favorable attitude towards the Hellenic Cypriotes would have been more in keeping with Great Britain's rôle as protector and liberator of small nations. In October, the British government offered to cede Cyprus to Greece if the latter would lend her aid in the operations against Great Britain's enemies (see *GREECE, History*). As Greece was unwilling to pay the price, however, the offer lapsed.

CYRENAICA. See *LIBYA*.

CZAPLICA, MISS.—HER EXPLORATIONS. See *EXPLORATION, Asia*.

DACIA CASE. See *U. S. AND THE WAR*.

DAHOMÉY. A French West African colony; one of the component parts of the government-general of French West Africa (q.v.). A recent estimate of population is 910,902, of whom 809,402 fetishist, 75,000 Mohammedan, 20,064 Roman Catholic, and 6500 Protestant. Capital, Porto Novo, with 40,000 inhabitants; other towns are: Abomey (12,372), Ouidah, or Whydah (13,000), Grand Popo (2115), and Cotonou (2456). The principal products for export are palm kernels (export in 1912 valued at 13,398,416 francs, in 1909 at 8,353,252), palm oil (6,361,320 and 6,452,100), dried fish (304,670 in 1912), live animals (155,713 and 151,378), corn (325,036 and 712,713), copra (105,263 and 99,420), cotton, kola nuts, etc. Imports and exports for 1912 were valued at 20,310,098 and 21,451,317 francs, respectively. A railway (722 kilometers), which, when completed, will connect Cotonou with the Niger at a point near Karimama, is finished as far as Savé (261 kilometers). The line has three main sections: Cotonou to Paouignan, 194 kilometers; Paouignan to Parakou, 246; Parakou to the Niger, 250. A branch from Cotonou (32 kilometers) runs to Ouidah and Segboroué. Ch. Noufflard was lieutenant-governor in 1914.

DAIRY FARMING. See *DAIRYING*.

DAIRYING. SUPPLY OF DAIRY PRODUCTS. The increase in the value of dairy products in the United States was hardly commensurate with the increased consumption and export demands which characterized the trade in 1915. There appeared to be a marked shortage of milk in New England and New York, due probably to a shortage of cows in that section, while the Middle West remained about normal. The dairy industry of the country suffered by reason of the spread of the foot-and-mouth disease, which, however, at the end of the year was under control as a result of the vigorous policy of eradication followed. Fortunately, the National Dairy Show herd of 700 head were saved by a most thorough and complete quarantine from which they were released in May (see also *VETERINARY MEDICINE*).

It was estimated by the United States Department of Agriculture that the average per capita milk consumption in cities of 2500 inhabitants or over was 112 quarts per year, and was

slightly higher in cities of 25,000 or over than in smaller cities. There was apparently less variation in milk consumption by months in the large cities than in the small ones, the fluctuations being less than 10 per cent. Investigations made by the New York Cornell Experiment Station showed that milk was being produced in that section at a net cost of \$1.21 per 100 pounds, and butter fat at 33.3 cents per pound. The average profit realized was 31 cents per 100 pounds, and the net profit per cow was \$20.39. The average cost of feed per cow was \$51.57, and the labor cost \$23.12. The profit from cows yielding 10,000 pounds per year of milk was 51 per cent greater than from those yielding 6000 pounds.

The cow testing associations were on a firmer footing than they had been in previous years. Many new associations were organized through the efforts of the Department of Agriculture and the extension divisions of the agricultural colleges. The results of these associations were highly satisfactory, many of the herds under their control making notable gains in yields, due to the elimination of inferior cows and the adoption of the most approved methods of feeding and management.

The spirit of coöperation has been especially evident in Wisconsin within recent years. There were in 1915 over 1500 farmers' companies in that State, of which 347 were creamery organizations, 290 cheese factories, and 35 live stock shipping associations. In point of number and the money handled the dairy enterprises exceeded all other coöperative agencies. The Wisconsin Station reported that approximately half of the cheese of the United States was made in that State. Two-thirds of this was American and the remaining one-third was Swiss, brick, and Limburger. Many fancy varieties were produced but they were of little commercial importance. Since 1909 the production had been decreasing in other leading States and increasing in Wisconsin. More than half of the cheese factories were coöperative. It appeared that a great portion of the middleman's charges in marketing cheese were legitimate, and for the present, necessary.

Notable dairy records for the year were as follows: The Holstein cow, Duchess Skylark Ormsby, completed a year's record of 27,761 pounds of milk containing 1205 pounds of fat. The Holstein cow, Finderne Pride Johanna Rue, made a record of 28,403.7 pounds of milk and 1176.47 pounds of fat in one year. The 3-year-old Holstein Frisian heifer, Finderne Holingen Fayne, produced 24,612.8 pounds of milk containing 1116.05 pounds of fat. The 10-year-old Guernsey cow, Murne Cowan, completed a year's record of 24,008 pounds of milk containing 1098.18 pounds of fat.

Announcement was made of the formation of the American Milking Shorthorn Breeders' Association, with headquarters at St. Paul, Minn. Animals will be registered as foundation stock until the end of 1918 under certain conditions.

EXPORTS AND IMPORTS OF DAIRY PRODUCTS. Cheese, butter, and butter fats were again becoming important factors in the United States export trade after a long period of comparative inactivity. Butter usually averaging about 3,500,000 pounds annually in the export trade, in the fiscal year 1915 went to nearly 10,000,000 pounds. During this period imports of butter were reduced by more than one-half, falling from

a little less than 8,000,000 pounds in 1914, to less than 4,000,000 pounds in 1915. American cheese, running at about 2,500,000 pounds a year, went to 54,000,000 pounds in the fiscal year 1915. Here also, as in the case of butter, the trade balance was transferred to the export side, for the year's imports of cheese last year totaled only 50,000,000 pounds, a decrease of 13,750,000 pounds from the total for 1914.

England became the largest foreign market for American butter, cheese, and condensed milk, having taken 3,333,000 pounds of butter, 48,500,000 pounds of cheese, and 4,000,000 pounds of condensed milk from the United States. Canada, Cuba, Panama, Australia, and Venezuela also took considerable quantities of American butter. Panama and the West Indies are important markets for cheese. American condensed milk was being exported in record-breaking amounts, with sales aggregating 37,235,627 pounds in the fiscal year 1915, against less than one-third that amount in 1911. Cuba led among the foreign markets for this American product, while very large amounts were sold in the Orient, chiefly Japan, China, and the Philippine Islands.

The war has diverted large quantities of Canadian butter and cheese to England that would otherwise have sought a market in the United States, eleven months' imports of butter being but 3,721,224 pounds, against 7,640,995, and of cheese 46,561,251 pounds, against 58,778,538 pounds last year. Italy and Switzerland were the leading sources of the cheese imported into the United States, having supplied in 1915 26.5 million and 22.5 million pounds, respectively, as against nearly 5.5 million from France, 3½ million from the Netherlands, 3.25 million from Greece, 1 million pounds from Canada, and smaller amounts from Norway, Germany, England, and Austria-Hungary.

DAIRYING IN FOREIGN COUNTRIES. Census reports of food supplies in Australia showed that from 30 to 40 per cent of the dairy cattle in that country were lost in consequence of drought, and that with the limited milk supply an output of only 13,000,000 pounds of cheese could be expected for 1915. The annual consumption in Australia was in excess of 18,000,000 pounds. There was likewise a serious shortage of butter, and while there was probably ample for home consumption, very little butter would be available for export. Australia was forced to become an importer instead of an exporter of butter. Large shipments were being made by American concerns.

The dairy industry in New Zealand had become an important factor in the prosperity of that country. At the close of the year ended April 30, 1915, there were 167 public creameries, 330 public cheese factories, 64 private creameries, and 24 private cheese factories in operation. Large exports of cheese and butter were being made from that country, Canada and the United States being the principal consumers.

The production of milk, butter, and cheese by dairy farmers in Glasgow and the west of Scotland showed a decided increase since the beginning of the war. Formerly the tendency was in many cases toward producing milk alone. The war, however, brought a rise in the prices of milk, butter, and cheese, particularly of cheese. The total value of the exports of condensed milk from Switzerland increased in value from \$8,529,634 in 1913, to \$9,151,674 in 1914. The

general situation in the condensed milk industry in 1914 was comparatively favorable. The reduced production of milk in Switzerland, due to a shortage of feed crops, and subsequently the difficulty in procuring sugar, threatened to curtail the condensed milk and certain other Swiss food products industries. See also AGRICULTURE.

LITERATURE. Among the important publications that appeared during the year were the following: *Proceedings of the 6th, 7th, and 8th Annual Conferences of the American Association of Medical Milk Commissions, 1912, 1913, and 1914* (Cincinnati, Ohio, 1915); W. A. G. Pennington, *Science of Dairying* (London, 1915); S. H. Ayers and W. T. Johnson, Jr., "Ability of Colon Bacilli to Survive Pasteurization" (*U. S. Department of Agriculture, Journal of Agricultural Research, February, 1915*); C. Thom and R. H. Shaw, "Moldiness in Butter" (*U. S. Department of Agriculture, Journal of Agricultural Research, January, 1915*); G. L. A. Ruehle and W. L. Kulp, "Germ Content of Stable Air and Its Effect upon the Germ Content of Milk" (*New York State Station Bulletin 409*); B. H. Hibbard and A. Hobson, "Markets and Prices of Wisconsin Cheese" (*Wisconsin Station Bulletin 251*); J. D. Brew, "Milk Quality as Determined by Present Day Score Cards" (*New York State Station Bulletin 398*).

DALLES-CELILO CANAL. See CANALS.

DAMS. One of the most important engineering questions under discussion in 1915 was the construction of dams for power development across rivers under the control of the Federal government. It was claimed that existing legislation seriously curtailed hydroelectric development that would be of direct benefit to many persons, and in his annual report for 1915, Secretary of War Garrison pointed out that the national general dam act had prevented the development of water power on navigable streams and characterized the law as a "makeshift which effectually prevents all development." Referring to it specifically, he stated:

"The general dam act does not offer the rightful and necessary inducement for an economical and profitable development, nor on the other hand would it adequately protect the interests of the public if development were possible under it. It is a general dam act in name only; while purporting to lay down general conditions to cover development in all cases, it nevertheless requires in each case the further special authorization of Congress, which made of each application an independent legislative proposition, and subjected each project to the delay and hazard of congressional action."

The Secretary also pointed out that the usual use of electric power, in cities and in factories, was not the only outlet for hydroelectric energy, and instanced the fact that the fixation of atmospheric nitrogen, through the use of the electric furnace, offers a tremendous field for the use of cheap power—a matter of particular importance at a time when nitrogen for explosives is so important a factor in military effectiveness. He urged that Congress enact suitable legislation along the lines of that which failed to pass in the Congress of the previous year.

The Arrowrock Dam, across the Boise River just above Boise, Idaho, the highest dam in the world, was officially dedicated on October 4th. This dam is 348.5 feet in height from the lowest

point of the foundation to its parapet, and is about 250 feet above the river bed. It is arched in plan to a 662-foot radius. The section is the normal gravity type. The length at the top is 1100 feet, and the width at that point 16 feet. At the base it is 240 feet thick. The total amount of concrete reached 610,600 cubic yards. The excavation amounted to 683,000 cubic yards. It was completed nearly two years ahead of time at a saving of more than \$2,500,000 on the original estimate. It is a part of the Boise project of the United States Reclamation Service, which embraces an area of 240,000 acres.

Work continued during the year on the Elephant Butte Dam described in the 1914 YEAR BOOK, and on Sept. 1, 1915, 560,000 cubic yards of masonry had been placed, leaving about 50,000 cubic yards to complete the structure, which was virtually finished by the end of the year, so that sometime in 1916 it would be ready for use. This dam is built of rubble concrete masonry with a smooth concrete face, and local conditions introduced many interesting problems.

During the year further progress was made on the Calaveras Earth Dam for the Spring Valley Water Company, of San Francisco. This dam, when completed, will be the highest earth dam in the world, with a crest of 240 feet above bedrock, and containing over 3,000,000 cubic yards of material. The dam was being constructed by the hydraulic process and by means of material placed on the lower slopes by teams loaded by steam shovels. The dam is located in a narrow valley with steep hills on either side, and as the earth on the slopes was not well suited to hydraulic excavation and placing, much of the material required had to be carried in a pipe line for a considerable distance in order to reach suitable earth. The Calaveras reservoir when completed was expected to increase the available water supply for San Francisco by 30,000,000 gallons per day, and would provide for considerable growth of the city, which now has a daily consumption of 45,000,000 gallons.

In 1915 progress was made on the cyclopean masonry dam which was being built near the present Holden reservoirs of the city of Worcester, Mass., to impound an additional water supply. This dam was to be 108 feet in height, from foundation to top, and 80 feet wide at base, and 17 feet wide at the top, which is 850 feet long. The dam closes the narrow outlet of a natural basin and is built on solid rock, so that a certain amount of the excavated material can be used in the dam masonry, while rock excavated near the dam site will be used for the concrete aggregates, and for making sand as well as the coarser concrete, two sand rolls having been installed. This work was being done by municipal labor, with small annual appropriations, and is estimated to cost about \$700,000.

The reservoir formed by the Roosevelt Dam across the Salt River in Arizona was filled to the dam crest for the first time on April 14th, and water passed over the spillway. This dam was 280 feet high above bedrock, 1080 feet long (including spillways), and the reservoir has a capacity of 1,400,000 acre feet.

The year saw also the completion of the Lahontan Dam of the Truckee-Carson irrigation project in Nevada. This earth embankment was 124 feet high, and supplied 290,000 acre feet of water for irrigation. It is across the Carson River, near Fallon and Hazen, Nev. The struc-

ture cost about \$1,500,000, and is unique in possessing twin spillways 250 feet long at either end of the dam, with a combined normal discharge capacity of 30,000 second feet, which converge on a circular pool 230 feet in diameter. There is also a reinforced concrete outlet tower with two cylindrical hydraulically balanced valves. In its construction there was involved an electrically operated plant and also a sand cement plant. For an earth embankment the Lahontan Dam presents many striking and interesting features.

The Great Falls Dam on the Missouri River near Great Falls, Mont., was dedicated August 11th, when water passed over the crest of the dam. The improvement of the Ohio River involves construction of a number of dams, and Dam No. 10, at Steubenville, Ohio, was completed November 4th, and locks placed in operation on that date.

One of the dam failures during the year was the Lyman Dam, an earth dike across the main channel of the Little Colorado River, about 12 miles south of St. Johns, Ariz. This dike was 450 feet long on the bottom, and 65 feet on the crest, 65 feet high, with a 12-foot crest, and a slope of 2.1 on both sides, and contained 200,000 cubic feet of material. The reservoir which it formed had a capacity of about 40,000 acre feet, being the next in size in Arizona to the Roosevelt reservoir. The dam failed on April 14th, and the reason assigned for this was that a portion of the dike across the channel below the outlet conduit did not have an opportunity to dry out properly and therefore was materially weak.

As in other States, Pennsylvania requires the consent or permission of the Water Supply Commission previous to the construction or change of any dam for power or other water obstruction, and during 1915 rules of inspection were issued by the commission to aid its engineering department and for the guidance of those intending to construct dams. With each application plans and specifications were required, including a location plan or map, a general plan of the dam and reservoir, a longitudinal section, typical cross section, detailed plans of the spillway, and other works, diagrams of forces, and their stresses acting on the structure. In Colorado also there is State supervision of reservoirs, and detailed regulations and specifications are provided for construction. While in Colorado there have been a number of failures of reservoir dams, it has been found that in practically every case there has been inadequate investigation of the foundation of the dam and of the materials used in it.

DANBURY HATTERS' CASE. See BOYCOTT.

DANISH LITERATURE. See SCANDINAVIAN LITERATURE.

DANISH WEST INDIES. Three West Indian islands (Saint Croix, 84 square miles, 15,467 inhabitants in 1911; Saint Thomas, 33 and 10,678; Saint John, 21 and 941), which compose a colony of Denmark. Negroes form the majority of the population, and the cultivation of sugar-cane is the chief industry. The sugar export from Saint Croix in 1911-12 was 10,023 metric tons; in 1912-13, 6063; in 1913-14, 5825. In 1913-14, the export of rum from Saint Croix was 86,957 gallons; cotton, 161,539 kilograms; cotton seed, 277,144 kilograms. Gover-

nor, L. C. Helweg-Larsen; government seat, Charlotte Amalie (Saint Thomas).

DARTMOUTH COLLEGE. An institution for higher education, founded in 1769 at Hanover, N. H. The total enrollment in all departments in the autumn of 1915 was 1470. The faculty numbered 142, which includes also officers of administration. During the year Prof. James L. McConaughy was appointed head of the department of education and director of the summer session; Dr. Philip Greeley Class, director of music; Henry T. Moore, assistant professor of psychology, in place of Walter Van Dyke Bingham; Herbert E. Cushman, lecturer in philosophy. No notable benefactions were received during 1915. The productive funds at the end of the fiscal year amounted to \$3,861,717, and the income to \$392,768. The library contained 135,000 volumes.

DEATH RATE. See VITAL STATISTICS.

DEFECTIVES. See CHARITIES, *passim*.

DE GOURMONT, RÉMY. See FRENCH LITERATURE, *Literary Events*.

DEGREE, Ph.D. in GERMAN UNIVERSITIES. See PHILOLOGY, MODERN.

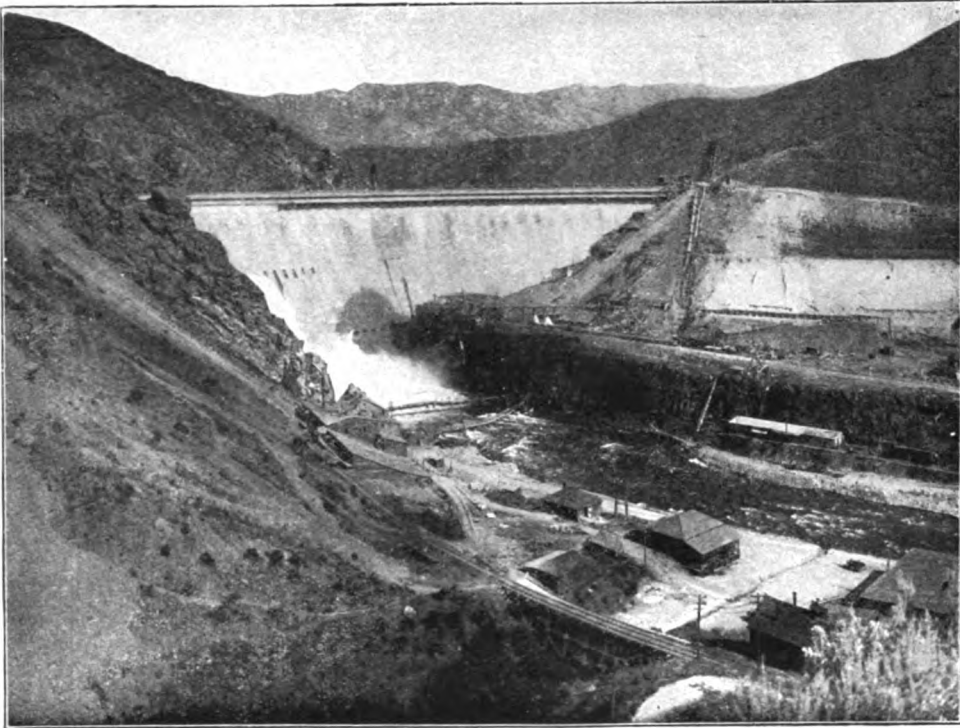
DELAFIELD, FRANCIS. American physician, died July 17, 1915. He was born in New York City in 1844, and graduated from Illinois College in 1860. He studied medicine at the College of Physicians and Surgeons, and received the degree in 1872. After post graduate work in London, Berlin, and Paris, he began practice in New York City. His investigation of the problems of medicine soon gave him a recognized place among the original workers of the day, particularly as a pathologist. He was appointed surgeon at the New York Eye and Ear Infirmary, and pathologist to the Roosevelt Hospital in the same year. In 1871 he joined the staff of Bellevue Hospital, and a year later became adjunct professor of medicine in the College of Physicians and Surgeons. Two years later he was elected to the chair of the theory and practice of medicine. From 1901 until his death he was professor emeritus. He was the first president of the Association of American Physicians. While professor of the College of Physicians and Surgeons, he founded and himself supported for some time the first pathological laboratory in the United States. He was called to Buffalo in consultation after the shooting of President McKinley. He received degrees of LL.D. from Illinois and Columbia universities. His writings include: *Hand Book of Post Mortem Examinations and Morbid Anatomy*; *Manual of Physical Diagnosis*; *Diseases of the Kidneys*; and *Handbook of Pathological Anatomy and Histology* (with Dr. T. M. Pruden).

DELAND, MARGARET. See LITERATURE, ENGLISH AND AMERICAN, *Fiction*.

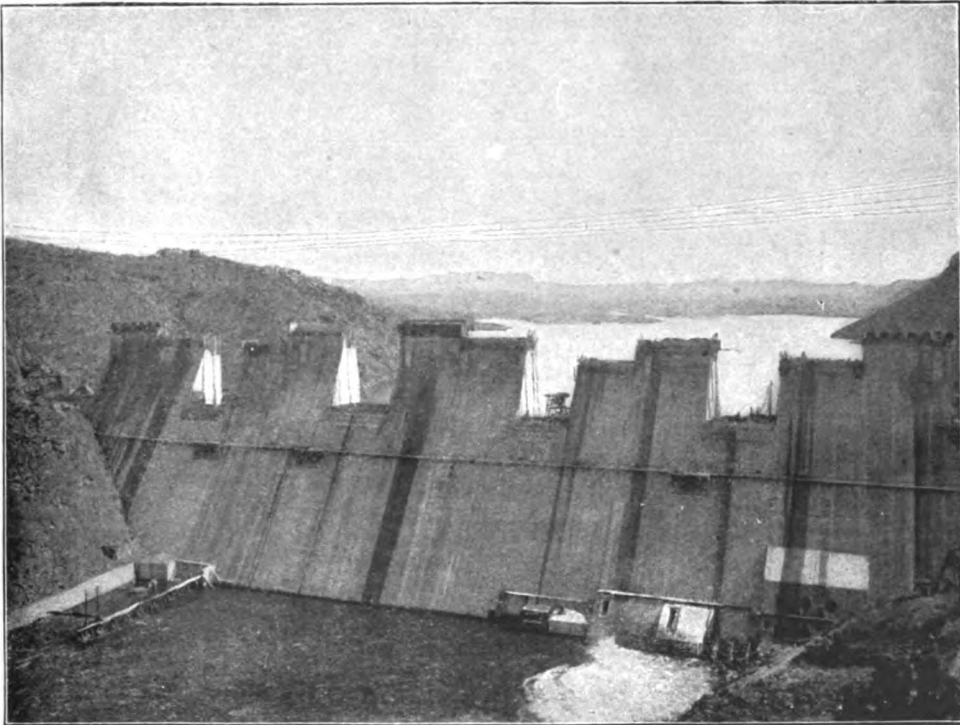
DELANY, JOHN JOSEPH. American jurist, died July 14, 1915. He was born in New York City in 1861, and was educated at the College of St. Francis Xavier in that city. In 1888 he graduated from the Columbia Law School. Appointed assistant corporation of council of New York City in the following year, in 1904 he became corporation counsel. He was elected to the Supreme Court of the State in 1910. Delany was prominent in important municipal litigation, including the fight for eighty-cent gas.

DELAWARE. POPULATION. The population of the State on July 1, 1915, was, according to

DAMS



ARROWROCK DAM
Boise, Idaho. Dedicated October 4, 1915



ELEPHANT BUTTE DAM
Rio Grande Project, New Mexico

TWO NOTABLE DAMS OF THE U. S. RECLAMATION SERVICE

an estimate of the United States Bureau of the Census, 211,698.

AGRICULTURE. The acreage, production, and value of the principal crops, as estimated by the United States Department of Agriculture, in 1914-15, were as follows:

		Acreage	Prod. Bu.	Value
Corn	1915	210,000	6,615,000	\$4,101,000
	1914	197,000	7,092,000	4,397,000
Wheat	1915	125,000	1,875,000	2,044,000
	1914	114,000	2,387,000	2,547,000
Oats	1915	4,000	184,000	68,000
	1914	4,000	108,000	54,000
Rye	1915	1,000	16,000	16,000
	1914	1,000	18,000	17,000
Potatoes	1915	11,000	1,045,000	784,000
	1914	11,000	880,000	616,000
Hay	1915	70,000	84,000	1,428,000
	1914	72,000	79,000	1,343,000

a Tons.

TRANSPORTATION. The railway mileage of the State in 1914 was about 335. No construction has been undertaken in recent years.

EDUCATION. The total school population is about 50,000, with an enrollment of about 36,000, and an average daily attendance of 23,000. There are 1000 teachers employed, of whom about 860 are women.

FINANCE. According to the report of the State Treasurer for 1914, the total receipts for that year amounted to \$685,273, and the disbursements to \$716,653. There was a balance on hand at the beginning of the year of \$45,797, and at the end of the year of \$14,418.

CHARITIES AND CORRECTIONS. The State has no board of supervision over the charitable and correctional institutions. The Associated Charities of Wilmington has a director in direct supervision over many philanthropic institutions. These include the Home for Friendless Children, The Home for Aged Women, St. Joseph's School for Orphan Colored Boys, the Florence Crittenton Home, Delaware Industrial School for Girls, Home of Merciful Rest, and the Layton Home for Colored Persons—all at Wilmington. There are, in addition, several institutions at Dover and Marshalltown, the Delaware Hospital for the Insane at Farnhurst, and Newcastle County Hospital. The Delaware State Tuberculosis Commission has general charge of the work for the prevention and cure of this disease.

POLITICS AND GOVERNMENT. There was little of political interest in the State in 1914. The Legislature met, but the laws enacted were merely local in their significance. The most interesting feature of the State's economic history resulted from the operation of the munitions plants at Wilmington and other cities. Some of the largest powder and munition factories in the country are located in Delaware. The large number of war orders received resulted in the employment of large numbers of men, and the State received a large amount of money. For comments on explosions occurring in munition factories during the year 1915, see UNITED STATES AND THE WAR.

STATE OFFICERS. Governor, Charles R. Miller; Lieutenant-Governor, Colen Ferguson; Secretary of State, George H. Hall; Attorney-General, Josiah L. Wolcott; State Treasurer, William J. Swain; Auditor of Accounts, John W. Luff; Commissioner of Insurance and Banking, William M. McCabe.

SUPREME COURT. Chancellor, Charles M. Cur-

tis; Chief Justice, James Pennewill; Associate Judge-at-large, Thomas B. Heisel; Associate Judges, Herbert L. Rice, William H. Boyce, Henry C. Conrad.

STATE LEGISLATURE:

	Senate	House	Joint Ballot
Republicans	9	19	28
Democrats	8	16	24
Republican majority..	1	3	4

DELCASSE'S RESIGNATION. See FRANCE, *History*, section so entitled.

DENMARK. A constitutional European monarchy situated north of Germany, between the North and Baltic seas. Copenhagen is the capital.

AREA AND POPULATION. The area and population by insular and mainland divisions, according to the census taken Feb. 1, 1911, compared with the figures for population in 1906, are shown in the following table:

Islands:	Sq. m.	Pop. 1906	Pop. 1911
Seeland	2,895	1,026,119	1,096,897
Bornhohn	227	41,081	42,885
Lolland-Falster	692	108,029	115,658
Fyn	1,841	289,046	303,179
Jutland:			
Southeast Jutland	2,827	452,445	492,264
Southwest Jutland	4,144	338,224	364,620
North Jutland	2,920	334,005	351,573
Total Denmark proper..	15,046	2,588,919	2,757,076
Faroe Islands	540	16,848	18,000
Total	15,586	2,605,267	2,775,076

The population of Denmark proper increased from 929,001 in 1801, to 1,969,039 in 1886, and 2,449,540 in 1901. Males (1911), 1,337,900; females, 1,419,176 (1,257,765 and 1,331,154 in 1906). The rural population in 1911 numbered 1,647,350, as compared with 1,565,585, an increase of 81,765; the urban, 1,109,726, as compared with 1,023,334, a gain of 86,392. Copenhagen (Köbenhavn), covering 28 square miles, had (1911) 462,161 inhabitants; Frederiksborg, 97,237; Aarhus, 61,755; Odense, 42,237; Aalborg, 33,449; Horsens, 23,843; Randers, 22,970; Esbjerg, 18,208; Vejle, 17,261; Fredericia, 14,228; Kolding, 14,219; Helsingör, 13,783; Svendborg, 12,667; Nykøbing, 11,010; Viborg, 10,885; Slagelse, 10,463.

Marriages in 1913 numbered 20,460 (20,533 in 1912); living births were 72,465 (74,651); still births, 1734 (1754); and deaths 35,378 (36,481).

PRODUCTION. Agriculture and dairying are the principal industries. About 80 per cent of the total area is productive; less than one-half the productive area is under crop, the remainder being forest, pasture, and meadow. The tables below give area (in hectares) and production (in quintals) of main crops, with yield per hectare in 1913:

	1913	1913	1914
		Hectares	
Wheat	40,512	54,044	54,044
Rye	276,009	245,786	245,786
Barley	233,714	241,409	241,409
Oats	402,939	428,387	428,387
Beets *	80,800	82,370	80,900
Potatoes	61,141	61,141	61,141

	Quintals			Qs.
	1912	1913	1914	ha.
Wheat	1,018,777	1,822,073	1,279,178	33.7
Rye	4,670,173	4,319,513	4,788,294	17.6
Barley	5,676,095	5,956,184	4,974,452	24.7
Oats	7,647,923	8,290,168	6,729,225	19.4
Beets *	8,035,279	9,300,077	6,018,361	287.8
Potatoes	8,265,000	10,697,378	9,456,627	175.0

* Sugar beets.

Creameries in operation in 1911, 681, with 104,557 work people; the milk employed was from 605,208 cows, with an average production of 2570 kilos of milk per cow. The live stock censuses of July 15, 1909, and July 15, 1914, returned 535,018 horses and 568,240, respectively; cattle, 2,253,982 and 2,462,862 (of which, cows 1,281,674 and 1,310,268); sheep, 726,879 and 514,918; swine, 1,467,822 and 2,496,661; goats, 40,257 and 40,670; fowls, 11,815,783 and 15,153,999.

Margarine factories (1912), 26, with total output of 39,620 metric tons; beet-sugar mills, 9, with total output of 134,670 metric tons. Fisheries products (1911) were valued at 15,230,200 kroner.

COMMERCE, ETC. The general and special trade is shown below in kroner:

	1910	1912	1913
Imports:			
General ..	634,407,000	817,512,000	855,351,000
Special ...	577,166,000	740,015,000	777,424,000
Exports:			
General ..	548,074,000	682,082,000	721,290,000
Special ...	485,374,000	596,723,000	637,360,000

Principal exports (1913, special trade), values in thousands of kroner: Provisions, eggs, etc., 459,418; animals, 68,726; beverages, 1819; cereals, etc., 13,370; metals and hardware, 8058; colonial goods, 9306; wood and wooden-ware, 1722; textile manufactures, 1074.

Principal countries of origin and destination, general trade, values in thousands of kroner:

	Imports		Exports	
	1912	1913	1912	1913
Germany	314,286	328,308	181,646	178,694
United Kingdom ..	135,887	134,562	373,104	410,418
Sweden	69,060	71,104	38,352	84,088
Norway	9,166	8,755	18,541	19,300
United States	69,354	86,979	9,489	7,853
Russia	56,179	59,411	16,347	19,275
France	19,406	20,935	3,302	3,342
Netherlands	20,863	21,208	5,270	4,123
Belgium	9,902	10,275	1,726	8,052

Vessels entered in the 1913 trade, 41,071, of 4,615,800 tons; cleared, 42,042, of 1,637,067. Merchant marine (Jan. 1, 1914), 4386 vessels, of 566,727 tons.

Railways in operation at end of 1913, 2390 miles (1243 State owned); State telegraph service (1914), 8373 miles; telephone wires, 342,522 miles; post offices, 1171.

NAVY. The fleet, maintained for purposes of coast defense, is composed of 3 monitors carrying, each, two 9.4-inch and four 6-inch guns, and 1 carrying one 9.4 and three 4.7; 3 torpedo gunboats; 14 first-class torpedo boats; 6 submarines; besides an old battleship, a cruiser, and some small craft. Building: a coast-defense vessel and several submarines.

FINANCE. The budget for the financial year 1914-15 estimated the revenue at 132,525,240 kroner (taxes and duties, 83,586,400), and the

expenditure at 129,696,705 (war, 17,359,516; worship and instruction, 16,383,889; interior, 19,057,212; marine, 10,001,636; debt, 12,370,401; justice, 10,276,167; finance, 10,075,547). The debt stood (March 31, 1914) at 358,962,084 kroner.

GOVERNMENT. The King is the executive, assisted by a ministry of eight members, appointed by him and responsible to the Parliament, or Rigsdag. This body consists of an upper house of 66 and a lower of 114 members. Justice is administered by judges of the Hundreds and by city magistrates, from whose courts appeals are taken to the superior courts at Viborg and Copenhagen. There is also a supreme court of last recourse of 24 judges at Copenhagen. In case of impeachment of ministers the Upper House appoints 4 judges to sit with the Supreme Court as a joint tribunal. Reigning sovereign, Christian Charles Frederick Albert Alexander William, born Sept. 26, 1870; married April 26, 1898, to Alexandrine, Duchess of Mecklenburg (born Dec. 24, 1879); proclaimed king (Christian X) May 15, 1912, upon the death (May 14) of his father, King Frederick VIII. Heir-apparent, Prince Christian Frederick Francis Michael (born March 11, 1899).

HISTORY

CONSTITUTIONAL REFORMS. The democratic constitutional amendments which had been defeated by the Landsting in 1914 (consult YEAR BOOK, 1914, DENMARK) were again proposed by the Folkething in the spring of 1915, and since changes in the membership of the Landsting had in the interim created a favorable majority, the amendments were now finally passed and received the King's assent, June 5, 1915. Under the amended constitution, the property qualification which had previously excluded the poorer classes from voting for the members of the Landsting was abolished; the twelve members hitherto appointed by the Crown were henceforth to be elected; and full political status, implying both the right to vote in parliamentary elections and the privilege of eligibility to sit in the Folkething, were conferred upon the women of Denmark. A fortnight later another important constitutional amendment, enfranchising the women of Iceland, received the royal signature. Shortly after the passing of these constitutional reforms, particularly violent attacks upon the Radical government began to appear in the Conservative press of Denmark, coupled with insistent demands for the creation of a coalition cabinet. In reply to its critics, the government called a conference of all parties, and invited the Opposition to state its grievances. As the criticism of the government's interpretation of the duties of neutrality in the war had been especially keen, it was expected and freely predicted that the neutrality issue would cause the overthrow of M. Zahle's Radical cabinet. By meeting frankly his antagonists in conference, however, M. Zahle was able to disarm his critics, and maintained himself in office. Consequently the Conservatives were unable to erase the constitutional amendments from the statute book, and Premier Zahle could confidently announce, October 26th, that the forthcoming elections in the summer of 1916 would be conducted under the new electoral laws.

EFFECT OF THE WAR UPON DENMARK. Rumors that foodstuffs and contraband commodities

were being imported into Germany by way of Denmark received wide credence and evoked caustic criticism of Danish neutrality in the British press. Trade statistics, showing that Denmark's imports from the United States had suddenly increased from \$600,000 in 1913, to \$7,000,000 in 1914, were adduced as evidence that Denmark was serving simply as a channel for German imports. In answer to this insinuation, the Danish foreign minister, M. Scavenius, on January 11th explained that before the war a large part of Denmark's imports had come through Germany, whereas now they were being obtained direct. Owing to the delays and uncertainties of commerce during war-time, moreover, prudent traders naturally desired to maintain a surplus store of imported merchandise, and ordered larger quantities than were actually required for current consumption. In March, Denmark, in concert with the other Scandinavian States, made representations to Great Britain, protesting against the latter's policy of interfering with neutral shipping, as enunciated by the British Order in Council of March 15th. On May 26th the Danish steamer *Betty* was sunk by a German submarine. In response to Danish remonstrances, Germany agreed, August 23rd, to pay damages for the loss of the steamer. Denmark was also forced to lodge a protest with the German government with regard to the destruction of the British submarine *E-13*, which had run aground on the Danish island of Salt-holm. (For further information concerning naval events and commercial warfare in Scandinavian waters, consult the article, WAR OF THE NATIONS.)

THE SCANDINAVIAN INTERPARLIAMENTARY UNION. In September, representatives from the three Scandinavian countries, Denmark, Norway, and Sweden, met in the Northern Interparliamentary Union Congress at Copenhagen. Especially interesting was the speech of former Finance Minister Neergard, chairman of the Danish War Insurance Institute, reviewing the effect of the war upon Denmark's economic life. "There is no more vital issue during the war," said M. Neergard, "than the security of neutral shipping." Especially for the Scandinavian peoples he held this to be true. The planting of mines in the path of neutral commerce had been one of the most injurious practices of the belligerents. "At the start [of the war] the North Sea became a hotbed for mines, and it was only after repeated protests that such routes were established as brought comparative safety to traffic. In most instances the Danish War Insurance Company has been compelled to make these routes obligatory, no matter what has been the inconvenience to ship-owners. Likewise, in the Baltic many mines have been planted, and the losses on this score to date amount to 10 ships, valued at 3,700,000 crowns." The fact that the mines usually defied identification, and that damages consequently were impossible to obtain, was particularly irritating. Since May 27th, however, no losses had been occasioned by mines. A new question had since arisen, the question of contraband. England, M. Neergard admitted, observed the Declaration of London in regard to contraband more strictly than Germany, for Germany considered the Declaration void, whereas "Great Britain is strong enough to secure its prizes in a more conventional manner." In the question of neutral prizes, "Germany has pro-

ceeded in the most unconcerned manner as regards formerly established regulations. It is certainly contrary to the rights of nations that Germany should destroy neutral ships." M. Mo-vinckel, a Norwegian delegate at the congress, gave out the interesting information that although at first Norway's shipping interests had suffered enormously—100,000 crowns a day—and although during the first year of the war Norway had lost 61 ships, valued at 18,000,000 crowns, either by mine or by submarine, nevertheless, under the protection of a government insurance organization, Norway's merchant marine had increased in value within the past year from 400,000,000 crowns to 500,000,000 crowns. A delegate from Sweden made a similar statement for his country: that Swedish shipping had been paralyzed at the beginning of the war, but that since the policy of State insurance had been adopted, the prosperity of Swedish shipping had in large measure returned. Before disbanding, the Congress of the Interparliamentary Union passed a resolution in favor of maintaining the policy of neutrality and of close co-operation among the three Scandinavian States.

THE SCANDINAVIAN PEACE CONGRESS AT COPENHAGEN. In September, a Peace Congress representing Denmark, Sweden, and Norway, was held in Copenhagen. Many helpful suggestions were made for methods of promoting the cause of peace. Historians should treat of peaceful progress rather than of battles and treaties. A universal language would be a great step forward in the direction of international solidarity. "Children should not be allowed to play with tin soldiers." "In the universities the seed of peace should be firmly implanted in the mind of youth," said another delegate. The resolutions finally adopted by the Congress were chiefly directed against compulsory military service, on the ground that it was not only likely to lead to war, but also infringed the rights of individuals. See INTERNATIONAL PEACE AND ARBITRATION.

DENTAL SCHOOLS. See UNIVERSITIES AND COLLEGES.

DEPARTMENT STORES. See ARCHITECTURE.

DE PAUW UNIVERSITY. An institution for higher education, founded in 1837, at Greencastle, Ind. The total attendance in all departments in the autumn of 1915 was 883. The faculty numbered 40. There were 27,725 volumes in the library. There were no notable changes in the membership of the faculty, and no noteworthy benefactions were received. The president is George R. Grose, A.M., D.D.

DERNBURG, DR. BERNHARD. See UNITED STATES AND THE WAR.

DESCLAUX GRAFT CASE. See FRANCE, *History*, section so entitled.

DIABETES. Fasting and a low diet have long been known to benefit sufferers from diabetes mellitus, but a new method advocated by Allen, of the Rockefeller Institute, puts the treatment on a more scientific basis than it has hitherto possessed and makes the method almost specific in uncomplicated cases. The object of treatment is to produce a sugar-free and acid-free urine. Experiments show that this object may be attained by an initial fast of from 8 to 10 days. Hitherto a rapid loss of body weight has been considered a dangerous risk in the fasting treatment, but this fear is shown to have

little basis. After the excretion of sugar has been stopped and the acidosis controlled, a suitable diet is advised; but instead of attempting to increase the weight, the aim is now to keep the weight low in the belief that the reduction is beneficial. Any gain in weight which results in a return of glycosuria is harmful. During the fasting period alcohol may be given until the ketonuria disappears. Even weak and emaciated patients are said to bear the fasting without untoward results. Their behavior indicates that they are suffering from a kind of intoxication, rather than from a lack of nutrition.

As an article of diet for diabetics, the soy bean has been urged as a nourishing food. It is almost free from starch, and at the same time rich in protein and fat. The soy bean (*Glycine hispida*) is an annual leguminous plant, grown extensively in Japan and China, and used for food from time immemorial. Over 200 varieties of the plant are known. It was introduced into the United States on the return of the Perry expedition from Japan, in 1853, but it was known, both in Europe and this country, before this time, as a botanic curiosity. Street and Baily, of the analytical laboratory of the Connecticut Experiment Station, have analyzed several varieties of soy bean grown on the station farm, giving the following average percentages: water, 10; ash, 5.54; protein, 38.29; fibre, 4.64; nitrogen-free extract, representing the total carbohydrates, 26.64; and fat, 14.89. The average percentages of commercial soy bean flours are: water, 5.1; ash, 4.5; protein, 42.5; fibre, 3.7; nitrogen-free extract, 24.3; and fat, 19.9. The carbohydrates consist of forms not considered dangerous to diabetics. The bean is just beginning to take a place as a farm crop. It is a palatable vegetable, but is not in general use as human food, being employed chiefly as a forage plant, for ensilage and fertilizer. See C. V. Piper, and T. H. Nuelsen, "Soy Bean" (*Farmers' Bulletin*, 372, U. S. Dept. Agriculture, 1909); and Carleton R. Ball, "Soy Bean Varieties" (*Bureau of Plant Industry*, 98, U. S. Dept. Agriculture, 1907).

DIAMONDS. See MINERALOGY, section so entitled.

DIAZ, PORFIRIO. President of the Republic of Mexico from 1876 to 1880 and from 1884 to 1911, died at Paris, France, July 2, 1915. When he first assumed the reins of government, revolutions and brigandage were rampant, ignorance, poverty, and corruption everywhere prevailed.

Diaz first of all was a fighter. The revolutions he crushed with an iron hand; and was successful in suppressing brigandage and corruption. Turning his attention to the development of the vast resources of his country, he invited the investment of foreign capital, at the same time seeing to it that no internal disorder and lawlessness should exist to frighten away the desired investors.

Industrial establishments of every type sprang into being, giving employment to thousands. The banking business of the country was put on a firm basis for the first time. Vast engineering works, including the draining of the valley of Mexico, the construction of 15,000 miles of railroad, and the building of many reservoirs, were undertaken. While all these plans for the betterment of his country were being carried out Diaz also found time to swing his energies into still another channel of perhaps

greater importance, that of education. He established a public school system and founded normal schools, manual training schools, colleges, and professional schools. Nor were women overlooked in Diaz's educational schemes, and the first of his girls' institutions of learning was opened at his native town of Oaxaca.

In carrying out his programme of reforms, he was frequently accused of arbitrary conduct. He was, in fact, an absolute dictator, and the history of Mexico prior and subsequent to his régime would seem to indicate that only a man of this strong type could hope to attain similar success. He knew his people, or rather mixture of peoples, and appreciated that a firm hand was needed if order and progress were to be obtained.

Diaz was born in Oaxaca on Sept. 15, 1830. His father was a Spaniard, and his mother the daughter of a Spaniard and an Indian woman. The death of the father, when Porfirio was only three years old, left the family in the throes of poverty. Friends, however, came to the rescue and young Diaz was enabled to study for the priesthood. As he grew older, the idea of a church career lost its appeal and he decided to devote himself to the law. In taking this step he followed the advice of Juarez, who was later to become president of Mexico.

When war broke out between Mexico and the United States, Diaz declared himself against the rule of Santa Anna and an order was issued for his arrest. He took refuge in the mountains and later joined a band of Indian revolutionists, of which he became commander. At first he met with success in combat with the government troops, but his band was finally dispersed, and he remained in hiding until 1855, when General Alvarez overthrew Santa Anna.

Diaz was made sub-prefect of Ixtlan by Alvarez and immediately began to organize the Indians in his territory into an army. A revolution was started in November, 1855, which forced Alvarez to resign. Gen. José Maria Garcia raised an army which he led against Diaz, who with his Indian forces won a signal victory and induced Garcia to abandon his plans. An uprising in Tehuantepec next demanded the attention of Diaz, who emerged a victor but only after being severely wounded.

The revolution was eventually quelled and Juarez succeeded to the presidency. Diaz was appointed a lieutenant-colonel, although but 28 years old, and also was chosen deputy to the national Congress. When Napoleon III made his attempt to found an empire in Mexico, Diaz was put in military command of Jalapa, which was occupied by a French army. He won much praise for his skillful conduct of the campaign in that section and came to be looked upon as one of the ablest and most patriotic of the Mexican generals.

After the battle of Santa Ines he was captured by the French, but escaped and joined President Juarez and his army in Northern Mexico, being placed in command of the native troops, whom he reorganized effectively. In 1863 Diaz was made a general of division, the highest rank in the Mexican army. The following year he met with reverses in battle and was obliged to surrender to the French General Bazaine. Once more he escaped and started his third campaign against the invaders. The interference of the United States at this juncture

restored peace to the country, Diaz capturing the Emperor Maximilian and marching into the capital in 1867.

After being an unsuccessful candidate for the presidency against his friend Juarez, Diaz retired for the time from public life. In 1871 he organized a rebellion against the government. During the fighting his brother, Felix, was killed, and Diaz was forced to flee. At the death of Juarez he pledged his support to Lerdo de Tejada, but in 1874 he started an insurrection, was defeated and took refuge in the United States. Two years later he returned to Mexico and, raising an army, triumphed over Lerdo at Tocoac. In 1877 he became president. As the constitution provided that no man should hold the office of chief executive for two consecutive terms, Diaz was succeeded in 1880 by his close personal friend, General Gonzalez, while he became governor of Oaxaca. Diaz was unanimously elected president in 1884 and, changing the constitution, continued in office term after term until his resignation in May, 1911.

The fall of Diaz was brought about by the rebellion launched by Francisco I. Madero, one of the leading capitalists of the country, and representing the large and constantly growing number of Mexicans who felt Diaz was flagrantly abusing his power. Diaz left Mexico soon afterward and passed his remaining days in various European capitals, death coming to him in Paris. See MEXICO.

DIET. See PELLAGRA.

DIETETICS. See FOOD AND NUTRITION.

DIGESTION. See FOOD AND NUTRITION.

DIPHTHERIA. The control of this disease has been advanced by the use of the Schick test, which has been extensively used during the past year. This test consists in injecting, beneath the superficial layers of the skin, a diluted standardized diphtheria toxin of such strength that 0.1 c.c. contains $\frac{1}{60}$ of the minimum lethal dose for a guinea pig weighing 250 grams. A positive reaction is characterized by a steadily increasing area of reddening and induration about the site of the puncture, reaching its maximum in 48 hours and lasting for about a week. Such a reaction indicates that the subject is susceptible to diphtheria, i.e. he has not sufficient antitoxin in his blood to resist an invasion of diphtheria bacilli. When there is no reaction, the subject is immune and possesses sufficient antitoxin in his blood to resist contagion. The value of the Schick test lies in the fact that it is now possible to discriminate between immune and non-immune persons, especially nurses, children, and others who may be exposed to diphtheria, thus rendering unnecessary the administration of prophylactic doses of antitoxin in those found by the test to be immune. It is also of value in detecting "carriers" who are always non-susceptible and give a negative reaction; yet a culture taken from them will usually show a growth of diphtheria germs. It has been found by Kolmer and Moshage that 40 to 50 per cent of children under 15 years of age react positively; also that immunity conferred by an injection of antitoxin begins to disappear in 10 days and is lost entirely in about four weeks; also that scarlet fever patients are especially susceptible to diphtheria. The immunity conferred by an attack of diphtheria is of short duration or it may be entirely absent. The New York Health Department encourages the general use of the Schick

test and supplies an outfit to physicians for its application.

DIRIGIBLE BALLOONS. See AERONAUTICS; and MILITARY PROGRESS.

DISASTER AT SEA. See SAFETY AT SEA.

DISCIPLES OF CHRIST. The total membership in this religious body in 1914 was 2,283,003. There were 17,236 churches, and 14,184 ministers. The sect has two bodies: The Disciples of Christ proper, with 1,363,163 communicants, 8494 churches, 6161 ministers; and the Church of Christ, with about 157,000 communicants, 2700 churches, and 2100 ministers. The churches lie chiefly in the Middle West and in the South, though the denomination is represented in nearly every State in the Union. Churches are also found in Australia, and other provinces of Great Britain, in Cuba, Scandinavia, and the Philippines. The denomination controls 26 institutes of learning. Missionary work is carried on in several countries. The income of the missionary societies in 1914 was \$1,506,716. Of the general convention, which met in October, 1915, Dr. F. W. Richardson, Kansas City, Mo., is president, and Rev. Robert G. Frank, Liberty, Mo., is secretary.

DISEASE AND FOOD. See FOOD AND NUTRITION.

DISEASE CARRIERS. See INSECTS, PROPAGATION OF DISEASE BY.

DISEASES, OCCUPATIONAL. See LABOR LEGISLATION; and OCCUPATIONAL DISEASES.

DIVING. In the raising of the United States submarine *F-4*, which sank in the harbor of Honolulu, Hawaii, March 29, 1915, the United States made use of experiment and training in deep water diving which had been carried on for two years previously. These experiments carried much further some that were undertaken by the British government in 1906 and 1907, where divers had been able to go down to a depth of 200 feet in safety, the best results being secured by bringing the diver up by stages, allowing a period of from 15 to 30 minutes at each stop for him to become used to the altered pressure. In other words, the trouble was due to the improper decompression, and the blood which had taken up nitrogen from the air did not have opportunity to eliminate it. In the American navy the greatest depth previously attained was 100 feet, and accordingly it was decided to undertake a series of tests in a tank where conditions equivalent to a depth up to 215 feet could be reproduced. These experiments were begun in February, 1914, and continued for a number of months, checking the English decompression table and accustoming the divers under training to deep water work, and also testing the various features of the equipment, such as suits, helmets, and other gear, as well as modern self-contained diving apparatus equipped with chemical and oxygen cylinders. As a result of this work an improved method of feeding air to the divers from compressed-air cylinders instead of by hand pumps was adopted, properly devised valves, air washers, and other devices regulating the supply of air. A diver's telephone was also devised so that conversation was possible at any time, where formerly the diver depended on signals by line. This work, which was mainly under the charge of Chief Gunner George D. Stillson, United States navy, was supplemented by actual tests in deep water, the torpedo boat destroyer *Walke* being equipped

with diving apparatus, including a recompression tank for the treatment of divers affected by the bends. During these practical tests, Chief Gunner's Mate Drelishak made a world's record at 274 feet, remaining under water long enough to work. Immediately upon receipt of the news of the disaster to the submarine *F-4*, Chief Gunner Stillson and five assistants, accompanied by a naval surgeon, were hurried to Honolulu, and the submarine was found covered by about 275 feet of water. The divers were able to attach lines to the vessel, and the greatest depth attained by any diver, 288 feet, a world's record, was made.

DOCKS AND HARBORS. UNITED STATES.
New London. The State of Connecticut during the year 1915 was engaged in the construction of a 1000-foot pier, 200 feet wide, at New London, at a cost of \$1,000,000. The design adopted under the appropriation made by the State Legislature in 1911 called for a fill inside of masonry bulkheads, with outside deck made up of pre-cast concrete slabs resting on creosoted timber piles. This new pier, made for a steamship terminal, was designed for a commercial life of 25 years, this time being selected, as it was thought that in the interval changes in transportation would render of doubtful utility any more permanent construction.

New Orleans Improvement. During the year work was begun on an important port improvement in New Orleans, whereby a large wharf, six large reinforced concrete cotton warehouses, and a railway terminal covering approximately 100 acres of ground, and costing \$3,500,000, were put under way. The terminal wharves, located on the Mississippi River, were to be two-story structures of reinforced concrete, 2000 feet in length, and 180 feet wide, built on pine piles placed 20 feet on centres each way. On these piles reinforced concrete columns were to be carried up to the first floor of the wharf, the two stories of the superstructure being 16 feet 8 inches, and 15 feet 8 inches, respectively. The wharf and general terminal were to be provided with conveyor apparatus for handling cargoes and a complete system of railway tracks.

New York Docks and Piers. The construction of the water terminal to be connected with the New Haven, Pennsylvania, and New York Central railroads at Hunt's Point, in the Borough of the Bronx, was in active progress during the year. This project involved the construction and filling in behind a 3600-foot bulkhead to reclaim 200 acres of ground, and required heavy pile driving, dredging, the placing of 400,000 tons of riprap, and extensive filling with other materials, not to mention suction dredge working. As much of the work had to be done in originally soft mud and varying types of bottom, practically every form of construction was involved, and a large amount of stone from Bronx subway cuts was employed in the filling. Work was in progress during the year on a new South Brooklyn pier at 35th Street, 1740 feet in length, 175 feet wide, this being the longest pier yet built in New York Harbor. This pier has a railway track on either side so that there can be direct transfer from ship to cars, which the steamship company owning the pier claims is both possible and essential. The shed of the pier is nearly 140 feet wide, and the tracks are placed outside the shed. The floor slabs are of reinforced concrete. The pier will be connected

eventually with the Brooklyn marginal railway. Two other piers, at 29th and 30th Streets, South Brooklyn, were also under construction. The pier construction was typical of other New York City piers, in that pile bents spaced 10 feet apart and trussed were employed, on which were laid reinforced concrete slabs. Work continued actively during the year on the new ocean steamship piers in the Hudson River at 46th Street.

Boston. During 1915 much excavation had been done for the new South Boston dry dock, which was to be the largest in the United States, being 1200 x 140 feet in over all dimensions.

Philadelphia. Two piers, known as the Southwark piers, were completed during the year at Philadelphia. It was part of a scheme ultimately to give the city a municipally owned waterfront of more than a mile. These two piers were the first of such a group, and represented the best construction yet undertaken by the city, being designed along the lines of the general Philadelphia type of construction with reinforced concrete substructures extending down to low water and carried on wooden piles. The superstructure was of structural steel with reinforced concrete facings. The two new piers, known as Nos. 38 and 40, are along the Delaware River at the foot of Queen and Christian Streets, 550 feet in length, 180 feet wide, and 200 feet apart. These piers are two-story structures with numerous elevators and sheds of various kinds, while the railroad tracks down the middle of each pier connect with the belt line on Delaware Avenue. The actual construction of this work, which will involve eventually the expenditure of \$24,000,000 for the South Philadelphia Railway improvement, began in April, and involved not only an extensive railway system to give access to the piers and to the various industries along the river, but also a systematic improvement of the water front.

Los Angeles. The city of Los Angeles had under construction a large timber wharf and shed on Mormon Island channel in the inner harbor and a concrete wharf and steel shed on the east side of the east channel in the outer harbor. The latter was one of the first sections of the outer harbor improvement, and is a dock 650 feet wide and 4000 feet long, with the main ship channel on one side and the east channel on the other.

Chicago. In Chicago a municipal pier was under construction for freight and passenger steamship service, with a recreation space and public hall in addition located north of the mouth of the Chicago River in line with Grand Avenue and Illinois Street. It was 3000 feet long and 292 feet in width. At the shore end was a head house forming an ornamental entrance and carrying offices on its upper floors. Two parallel double deck buildings, 2335 feet in length, are used for freight and passenger service, and are supported on a central 80-foot driveway. The remaining 665 feet of the pier length are devoted to recreation purposes, with an open upper deck which forms a shelter for the space below. Near the end of the pier is a municipal hall for public meetings, concerts, etc. Two double track railways extend along the sides of the driveway adjacent to the sheds, and a double track incline will connect the street railways with tracks on the upper deck of the pier. The pier is an elaborate structure and the total cost was estimated at about \$4,000,000.

Cleveland. At Cleveland, Ohio, the new Ninth Street pier in Lake Erie was opened for service late in June, so that the steamship companies could use the lake proper for docking instead of the channel of the Cuyahoga River, the lake front being protected by an extended breakwater. This new pier was built by the steamship companies and is connected to the trunk line railways. It is 720 feet in length and 300 feet wide, being made of a continuous line of concrete wall, part of which is founded on the remains of an old bulkhead and the rest on new pile construction.

St. Louis. Plans for the first section of the municipal dock system at St. Louis, Mo., were approved, during 1915, by the Board of Public Service, and an ordinance authorizing the construction was introduced in the Board of Aldermen. The estimated cost of the dock alone is \$255,000, and of equipment \$30,000. The first unit of the dock was to be 300 feet long out of a total length of 1200 feet, and was to be a reinforced-concrete structure, including both piling and decks. The dock will be open underneath and ripped. A railroad track was to extend down the centre of the dock, back of which a steel frame warehouse was to be built. The dock was to be equipped with two traveling cranes for transferring material between either boats and cars, or between boats and the warehouse, and the warehouse and platforms were to be equipped with electric trucks. The estimated cost of the other three sections of the dock, subsequently to be put under construction, was \$155,000.

Coal Dock at Toledo. At the opening of navigation on the Great Lakes a new coal handling plant, dock, and yard, containing one of the three largest car dumpers in the country, was put into use at Toledo, Ohio, by the Cincinnati, Hamilton, and Dayton Railway. This new terminal, which was constructed during the winter, involved 802 feet of concrete dock, concrete foundations for the unloader, approach, and run-off trestles, the relaying of the load and empty yards, and the erection of the unloader frame and machinery. The load yard has a capacity for 140 cars, and the empty yard for 96 cars. The new dock, except at the unloaders, is of reinforced concrete on piles cut off 18 inches below the water line.

BALBOA DRY DOCK. The important dry dock at Balboa for the Panama Canal, described in the YEAR BOOK for 1914, was practically completed at the end of 1915. A second dry dock had been planned, but its erection was not contemplated for some years.

CANADA. Halifax. The largest harbor work in progress during the year in North America was at Halifax, N. S., where the Dominion Department of Railways and Canals was developing the port as a part of a project to cost \$30,000,000. Contracts in force during the year totaled over \$7,000,000, and the new work involved the building of a large reinforced concrete pier, as one of six for deep water vessels, as well as a 2000-foot landing quay, and some 6 miles of railways, so as to insure communication throughout the terminal and with the railways. Halifax is a deep water, all the year, port, and the work is being prosecuted with the idea of making it an important landing place for the commerce of Canada. The construction work for the quay wall involved the use of 60-

ton concrete blocks stacked up to the required height and joined together laterally to form a continuous wall. Above low water granite facing is employed as a protection against frost and sea water. An elaborate system of shed and warehouse structures has been planned, and the construction was actively in progress during the year. The plan for the Halifax port development was so well worked out that it was believed that when completed the terminal costs at this port could be brought in proper relation to its operation costs, but it was a problem whether, with all its facilities and low terminal charges, sufficient commerce would be directed to Halifax in preference to Montreal and Quebec, to warrant the long railway hauls from the interior to the coast.

Prince Rupert. The official test of the 20,000-ton floating dry-dock at the ship-repair plant of the Grand Trunk Pacific Railway at Prince Rupert, Canada, was made successfully during the year, and the plant was ready for work. It includes a carpenter shop, shipbuilding shed, launching platform, machine shop, boiler and blacksmith shops, foundry, and a power plant.

Victoria. Progress was continued during the year at Victoria, B. C., in harbor development under the supervision of the Department of Public Works of Canada. The project involved the construction of 2500 feet of breakwater and two large docks in the outer harbor, all with rubber-mound foundations and reinforced concrete superstructure. The breakwater affords a 90-acre area of shelter, within which are the two docks, which have berthing space from 800 to 1000 feet in length. The improvement of the channel was also under way, and it was intended that the inner harbor should be used by smaller craft.

Toronto. During 1915, \$2,000,000 was being spent on the Toronto harbor improvement, being devoted to the water front between the Don and the Humber rivers, and supplementing the \$1,400,000 spent in 1914 in piles, cribs, dredging, and filling. The total estimated cost of the entire improvement, which is about equally divided between the Harbor Commission and the Dominion government, is \$24,000,000, and contracts for nearly \$11,000,000 have been let.

ZUYDER ZEE. One effect of the war was the postponement of the vast project for the reclamation of the Zuyder Zee, which had been discussed for a quarter of a century previously, and which latterly had been developed in distinct plans whose consideration by the Dutch Parliament was desired. It was necessary first to have the various departments of the government approve the plans, and this approval had been forthcoming for all the civil departments, but the War Department had been unable up to 1915 to pass on the military features of the reclamation project, as naturally this affected the schemes of national defense, and was one reason for the delay, although financial considerations also applied. The proposed scheme was to cost 300,000,000 guilders (a guilder equaling forty United States cents), and would reclaim at the same time an area of about 47,000,000 acres. The cost of the project would be spread over a number of years, but with the expense for mobilization, which up to September had amounted to 275,000,000 guilders within its European limits, and 65,000,000 in the colonies, with a flotation of a 200,000,000 guilder war

loan, there was little chance for expenditure on civic works. The project was of interest, as it involved a vast mileage of dykes, canals, with locks connecting the canals with the sea, large pumping stations, and various economic problems, such as the destruction of the salt water fishing industry and its possible replacement by a fresh water fishing industry of large proportions. Further, there would be involved the construction of an auxiliary system of canals to preserve water communication facilities for the towns on the Zuyder Zee, and a provision for suitable materials for the levees and other works, many of these not being native to Dutch soil. On the engineering side the project was so complete and interesting that its abandonment even temporarily was a source of regret. See CANALS.

DODGE, ARTHUR PILLSBURY. American lawyer, inventor, and publisher, died Oct. 12, 1915. He was born in Enfield, Mass., in 1849; studied law; and in 1879 was admitted to the bar. In 1886 he founded the *New England Magazine*, and later the *Bay State Monthly*, and the *Granite State Monthly*. For a time engaged in the publishing business, he later became interested, through his association with George M. Pullman, in motor power for railways.

DOLOMITE. See GEOLOGY.

DOMINICA. A presidency of the Leeward Islands colony. Most of the inhabitants are descendants of the original French settlers and speak a patois. Roseau, the capital, had, at the 1911 census, 6577 inhabitants. The island is fertile; coffee, sugar, spices, oils, timber, fruits, etc., are exported. Trade and finance statistics for the years 1907-14 are given in the following table:

	1907-8	1909-10	1910-11	1913-14
Imports	£121,650	£128,779	£147,332	£175,590
Exports	124,294	102,339	112,111	190,701
Revenue	39,865	39,521	42,133	48,143
Expenditure ...	31,486	41,860	39,603	47,572
Shipping *	508,631	713,227	694,985	572,222

* Tonnage entered and cleared.

See LEEWARD ISLANDS.

DOMINICAN REPUBLIC, THE. An independent state occupying the larger and eastern part of the Island of Haiti. The capital is Santo Domingo.

AREA, POPULATION, ETC. The republic consists of 12 provinces, with an estimated area of 48,577 square kilometers (18,756 square miles). Estimates of population vary. A 1913 estimate was 724,500. In October, 1915, the *Gaceta Oficial* stated the population (as for Dec. 31, 1914) at 657,270. The population of Santo Domingo was given as 26,486; according to an unofficial census, reported earlier in 1915, the population was 23,624. Estimated population of other towns: Santiago, 20,000; Puerto Plata (the chief port) and San Pedro de Macoris, 15,000 to 16,000 each; Samaná, La Vega, Sánchez, Monte Cristi, and Azua, 4000 to 5000 each.

Reported births in 1913, 27,332, and in 1914, 24,319; marriages, 2557 and 2022; deaths in 1914, 6393; immigration in 1914, 3930, and emigration, 1587. Primary instruction is free and nominally compulsory. In 1911 there were 590 schools, with 20,453 pupils. The state religion is Roman Catholicism.

PRODUCTION, COMMERCE, ETC. Agriculture and cattle raising are virtually the only source of national wealth, as mining and manufacturing are little developed. Sugar and cacao are commercially the leading crops. Others of importance are tobacco, coffee, cotton, and bananas and other fruits.

Several different sets of figures were published in 1915 purporting to state the commerce of 1914. The following are taken from the *Gaceta Oficial* mentioned above. Imports and exports in 1913, \$9,348,839 and \$10,047,297; in 1914, \$6,608,112 and \$10,611,228. Sugar export in 1914, 103,331 metric tons, valued at \$4,973,272; cacao, 20,825 metric tons, \$3,899,102. Considerably more than half the trade, both importation and exportation, is with the United States.

The length of railway in operation is reported at 282 kilometers (175 miles); in addition there are private lines for sugar plantations reported at 362 kilometers (225 miles). Telegraph offices, 16, with 352 miles of line. Post offices, 105.

FINANCE. The unit of value is the American dollar. For 1915, estimated revenue and expenditure, \$4,485,350 and \$4,490,821, respectively. Nearly four-fifths of the revenue is derived from customs. A treaty between the Dominican Republic and the United States authorized a loan of \$20,000,000 for the conversion of the debt, and established an American receivership of customs from April 1, 1905. The sum of only about \$14,000,000 was issued, the balance being kept against certain disputed liabilities and the provision of a fund for public works. Total outstanding, Dec. 31, 1914, \$13,042,850. A further loan of \$1,500,000, having no connection with the original loan, was issued in March, 1913. Both loans are guaranteed by the customs. By agreement between the Dominican and American governments in 1914, an American financial expert was appointed to control the national expenditure and the revenues other than those derived from customs.

GOVERNMENT. The executive authority is vested in a President, who, constitutionally, is elected by indirect vote for six years. The legislative power rests with a Congress of two houses, the Senate (12 members, elected for six years) and the Chamber of Deputies (24 members, elected for four years). In 1913 José Bordas Valdés became provisional President, assuming office April 14th. After the insurrection of 1914, Bordas Valdés resigned (August 27th), and the Congress elected Ramón Báez as provisional President. At elections held later in 1914, Juan Isidro Jiménez was chosen President, and on December 5th he was inaugurated for the six-year term.

HISTORY. Confusion in Financial Affairs. Late in January it became known that a shortage existed in the San Domingo Department of Public Works. Under the right which was given to the United States by the convention between the two countries, Secretary of State Bryan, on January 22nd, ordered an investigation of the situation. Three days later the State Department at Washington issued the statement: "When Nolasca, the auditor in charge of the Public Works Fund, was removed recently, a defalcation of some \$8000 was discovered. The irregularities date back at least two years. A further defalcation of \$1000 is reported under the Mann administration. Nolasca is a citizen

of Santo Domingo and his appointment was made by the Santo Domingo government. Full information has been asked for, and, in so far as the prosecution depends upon the actions of this government, instructions will be given when the facts are fully known." By the terms of the convention American officials were in charge of the customs houses of the republic as well as several other financial posts. It is the duty of these officials to see that the interest on the American-owned debt is paid monthly, that the sinking fund is enlarged, and that the residue of the customs, after 5 per cent is taken out for expenses, is turned over to the government. The defalcation of the two sums of \$8000 and \$1000 occurred entirely in the native administration of affairs, not in any department with which Americans were connected.

Sullivan Inquiry. On January 13th, President Wilson ordered an investigation as to the fitness of James M. Sullivan, minister to Santo Domingo. This investigation was in answer to a letter sent to the President by W. W. Vick, formerly connected with the American administration of Dominican customs. Mr. Vick charged that Sullivan owed his appointment to a political group representing the interests of the *Banco Nacional* of San Domingo, who had in view the control of concessions, government contracts, or deposits of government funds. The names of Secretary of State Bryan, ex-Governor Martin H. Glynn of New York, and Representative James H. Hamill were mentioned among those alleged to share in profits from the prospective contracts. Witnesses testified in New York, Washington, and Philadelphia, while officials likewise came from the *Banco Nacional* to offer their evidence. It became known in June that Senator Phelan, in charge of the investigation, reported to the President that Minister Sullivan had done nothing which involved moral turpitude, but was temperamentally unfitted for a diplomatic post. Consequently, Minister Sullivan's resignation was announced in July.

Internal Affairs. In March, Governor Zayas of Santo Domingo and two of his children were murdered at Azua, a small town 55 miles southwest of Santo Domingo. Zayas had gone to Azua to assume the duties of governor, and had been in office only two days. His assassination was brought about by political enemies. In April, Minister Sullivan reported a new revolution in the island. The cruiser *Des Moines* was ordered from Progreso, Mexico, to assist the gunboat *Nashville* in maintaining order. Three commissioners, Jacinto Peynarado, minister of justice, Frederico Velasquez, minister of public works, and Dr. Henriquez, were appointed in May to discuss financial matters with American financiers. In September, two new appointments were made in President Jiménez's cabinet. They were José Manuel Francisco Jiménez, minister of interior, and Francisco Herrera, minister of finance. Jiménez had held the portfolios of interior and public works in previous administrations.

DONALDSON, SIR JAMES. English scholar and educator, died March 10, 1915. He was born in 1831, and was educated in the Aberdeen grammar school, in the University of Aberdeen, at New College, London, and at Berlin University. In 1854, appointed director of the high school in Stirling, he became, in 1856, classical

master of the high school of Edinburgh, and in 1881 professor at Aberdeen University. He held this position until 1886, when he was appointed vice-chancellor and principal of the University of St. Andrews. He was one of the first to endorse simplified spelling. He wrote widely and authoritatively on a number of educational subjects. In 1907 he was knighted. His published writings include: *A Greek Grammar* (1863); *The Apostolical Fathers* (1874); *The Westminster Confession of Faith* (1905); and *Woman: Her Position and Influence in Ancient Greece and Rome, and Among the Early Christians* (1906).

D'OOGHE, MARTIN LUTHER. American scholar and educator, died Sept. 13, 1915. He was born at Zennemaire, Netherlands, in 1839, and graduated from the University of Michigan in 1862. He afterwards studied at the University of Leipzig. In 1867 he was appointed assistant professor of ancient languages at the University of Michigan, becoming acting professor of Greek language and literature there in 1868, professor in 1870, and professor emeritus in 1912. He was ordained to the Congregational ministry in 1878, and in the same year became one of the commissioners of the American School of Classical Studies, at Athens, and was its director in 1886-87. In 1884 he was president of the American Philological Association. He was an editor of Greek classics, the author of *The Acropolis of Athens* (1898), and a contributor to journals and periodicals, classical and archaeological. He received the degree of LL.D. from the University of Michigan, and D.Litt. from Rutgers College.

DOUGHERTY, WILLIAM EDWARD. American soldier, died July 13, 1915. He was born in Ireland in 1841, and was educated in private schools there, in Germany, and in England. He removed to the United States, and on the outbreak of the Civil War enlisted as a private in the United States infantry. He served throughout the war, rising to the rank of first lieutenant. He was appointed brigadier-general, and was retired at his own request, after over 43 years of service, in 1904. He took part in many important actions in the Civil War, and in 1865-66 was provost marshal in Louisiana. He served against the Indians from 1874-82, in Cuba in 1898, and in the Philippine Islands 1901-02.

DOUBINE. See VETERINARY MEDICINE.

DRAINAGE. The year 1915 has been one of comparative inactivity in the drainage of wet lands for agricultural purposes throughout the world. The European war practically stopped such work in belligerent countries and their colonies, and this covers most of the territory in the Eastern Hemisphere where such work was in progress. On the Western Hemisphere the wave of land reclamation, by both irrigation and drainage, which was so acute a few years ago, has subsided to a large extent and attention is being devoted principally to the attempts to utilize the lands made available in the past.

UNITED STATES. Land drainage in the United States is of two classes—(1) the drainage or protection from overflow of lands already occupied and producing some crops, where drainage is merely a means of improvement; and (2) the reclamation of lands which are now unproductive and waste by reason of insufficient drainage or overflow. Work of the former class goes on more or less continuously throughout the United

States without reference to land settlement projects, and was quite active during 1915. Work of the second class, however, seems to have been overdone in recent years, notably where large reclamation schemes in North Carolina, Florida, Louisiana, Arkansas, and Missouri have been undertaken. These projects were engaged in 1915 in efforts to colonize and utilize the lands reclaimed, and in the meantime few new projects were being undertaken.

Drainage reclamation work in the United States is done very largely under drainage district organizations—quasi-municipal corporations which have the power of eminent domain, the power to issue bonds which are a lien on the lands reclaimed, and the power to levy and collect taxes for meeting the cost of constructing, operating, and maintaining drains. Most of the States have such laws. In 1915 Alabama passed a drainage district law, and surveys for the first district to be organized under this law are in progress. The drainage district laws of Georgia and South Carolina have been passed upon and declared constitutional by the Supreme Courts of those States during the year, while the Utah district law is now before the Supreme Court of that State. The Colorado district law is also before the State courts.

The purpose of the drainage district organization is twofold: (1) To make it possible for the owners of wet lands to condemn rights of way for outlet ditches, and (2) to raise funds for the construction of drainage works. In the latter purpose the organizations have been only partially successful. In the reclamation of lands wholly unproductive, the value of the bonds issued depends upon the successful settlement of the reclaimed lands, and these bonds are therefore speculative in character, while the laws usually prohibit their sale below par. Investors are unwilling to assume the risk of such development without the chance for profit made possible by buying the bonds below par, and consequently the bonds are not readily marketable. This condition has led to proposals that the States in some way place their credit behind drainage district bonds, but so far none of the States has done this.

The most notable work of the year in drainage for flood protection is that being done under the Ohio Conservancy act, passed after the disastrous floods in that State in 1913. This law has been tested in the courts of the State and declared constitutional, and districts to carry out the objects of the law have been organized, plans have been made, and assessments for defraying the cost are being levied. Construction has not begun, however. The large drainage enterprises in the Florida Everglades almost ceased activity because of controversies between the State of Florida and the companies carrying on the work, and because of difficulties of selling land and of utilizing the land which had been sold but not completely drained. The reclamation enterprises in the vicinity of New Orleans were proceeding very slowly because the lands were not being taken up and utilized.

In the arid region of the United States there has been considerable activity in the drainage of lands injured by over irrigation and the rise of the ground water due to irrigation and seepage losses from canals. In many of the large irrigation projects begun but a few years ago the ground water has risen so rapidly that large

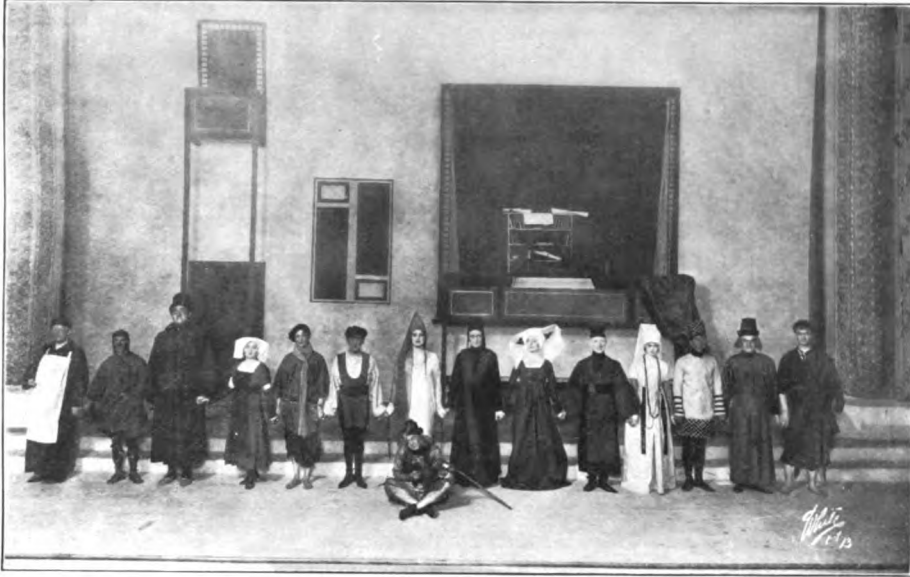
areas are already unproductive, and the continued use of these lands requires that the surplus water be removed and the ground water level lowered. This is noticeably the case in Western Colorado, Southern Idaho, Northern Wyoming, and many parts of Utah. On many of the government irrigation projects drainage has become necessary, and provision for this is being made. The drainage of irrigated lands presents many new problems, and the United States Department of Agriculture is giving considerable attention to the solution of these problems. During 1915 extensive observations and experiments have been made in the San Luis Valley in Colorado, and in the Snake River Valley in Idaho.

FOREIGN COUNTRIES. As has been stated, the European war has brought drainage reclamation work in the Eastern Hemisphere almost to a standstill. In the irrigated sections of Egypt and India the same trouble with rising ground water and the accumulation of harmful salts, so apparent in the United States, is being experienced, and drainage works have become necessary in connection with most of the large irrigation schemes. In Australia, the states of Victoria and New South Wales are continuing their irrigation work. In New South Wales this work consists of continued construction on the Burrinjuck scheme, while in Victoria the state is engaged in settling and reclaiming the lands supplied with water in former years.

In the Western Hemisphere Argentina is beginning the reclamation of her wet lands, but other than this there is little activity outside of the United States.

DRAMA, AMERICAN AND ENGLISH. The great war cast a shadow over the theatre season of 1915, not only in England, but also in America. In England, creative activity in the drama was brought almost to a standstill. Most of the London theatres remained open, but the majority were given up to the lighter types of entertainment. The most popular plays of the London season were American farces and melodramas, written cheerfully in American slang, and acted with verve and gusto by companies imported from America. With one notable exception, no new plays were brought out by the acknowledged leaders among British dramatists. *The Big Drum*, by Sir Arthur Pinero, which had been begun before the war, was produced early in the autumn by Sir George Alexander. It dealt satirically with the means employed to work up artificial reputations for current novelists by publicity campaigns in the newspapers. The play, as originally produced, ended unhappily; but the author soon substituted a different last act, which ended happily. He stated, as the reason for the change, that he had decided that the war-time audience needed optimism in the theatre even more than logic.

Several war plays were produced in both countries; but none of them really rose to the height of the occasion. One of the earliest of these was called in England *The Man Who Stayed at Home*, and in America *The White Feather*. It was written by Lechmere Worrall and J. E. Harold Terry, and dealt with the discovery of a nest of German spies in a seaside hotel on the east coast of England. A somewhat better play of the same type was *Inside the Lines*, by Earl Derr Biggers. The scene was set at Gibraltar. The hero, an officer in British uniform, was sus-



"THE MAN WHO MARRIED A DUMB WIFE"

Stage-set designed by Robert L. Jones



"A MIDSUMMER NIGHT'S DREAM"

As produced by Granville Barker

EXAMPLES OF MODERN STAGECRAFT IN 1915

pected to be a German spy, until in the end he turned out to be a British spy who had merely pretended to take orders from the Wilhelmstrasse in order to convert a German plot to blow up the British fleet in the harbor. More entertaining still was *Under Fire*, by Roi Cooper Megrue, a traditional war play of the secret service type, made alluringly up to date by a skillful localization in Belgium and Northern France. A one-act play, entitled *War Brides*, by Marion Craig Wentworth, which dealt tragically with the misery inflicted on the women of a war-ridden country, was acted with great success by Mme. Nazimova throughout the leading vaudeville theatres of the country. A sombre play, entitled *Moloch*, was written by Beulah Marie Dix. It depicted, in terms a little too abstract, the horror and futility of war. It set forth a powerful appeal for peace; but it failed in the theatre, both when it was produced in Chicago in the spring, and when it was produced in New York in the fall. More ambitious still was *Armageddon*, an attempt by the dramatic poet, Stephen Phillips, to deal with the subject of the war in a large Miltonic manner. This piece was not produced in America, but it was published in both countries. In December, Stephen Phillips died, at the age of 47, and England lost her one poetic dramatist of unquestionable talent. Early in the spring, the American novelist, Justus Miles Forman, hastily wrote a war-play called *The Hyphen*, which dealt with the menace of the German spy-system in America. The play was produced by Charles Frohman; but it had been both written and rehearsed without sufficient preparation, and it failed in the theatre. Shortly afterward, the author and the manager sailed together for England on the *Lusitania*, accompanied by the well-known dramatist, Charles Klein; and all three were killed when the ship was destroyed by a German submarine on May 7th. The loss of these three men was the greatest tragedy of the year in the theatrical world of England and America.

In the American theatre, the most important event of the year was the advent of Granville Barker as a producing manager. Invited to New York by the Stage Society, and backed by the founders of the New Theatre, Mr. Barker installed himself in Wallack's Theatre in January and produced a repertory consisting of *The Man Who Married a Dumb Wife*, by Anatole France, *A Midsummer Night's Dream*, and Bernard Shaw's *Androcles and the Lion* and *The Doctor's Dilemma*. All four plays were admirably acted and beautifully produced; and the repertory ran successfully until April 30th, when it became necessary to vacate Wallack's Theatre because arrangements had previously been made to begin the demolition of the building on the following day. The last night at this historic playhouse was celebrated with appropriate ceremonies. The Barker productions brought the American public face to face with that new stagecraft which, initiated by Gordon Craig, has been gradually developed, in the last dozen years, in Russia, Germany, and England. The purpose of this movement is to make the modern theatre as hospitable to romantic and poetic plays as it is to realistic plays. The essential principles of the new stagecraft are the following: First, a return to the inner and outer stage of the Elizabethan theatre; second, the abolition of foot-

lights and the substitution of overhead lighting; and third, the treatment of scenic backgrounds in a summary and decorative spirit, instead of in the detailed and photographic spirit of the preceding period.

The leading American stage-director, David Belasco, was immediately influenced by these innovations. In the early spring, he produced a romantic play, *Marie Odile*, on an apron-stage devoid of footlights; and in the late summer, he produced a contemporary comedy, *The Boomerang*, on a stage lighted wholly from the top and from the sides. These two pieces, incidentally, must be counted among the very best American plays of the year. *Marie Odile*, by Edward Knoblauch, was a lovely and exquisite work of pure poetic fancy; and *The Boomerang*, a light and alight comedy of love and jealousy, was written with great artistic delicacy by Winchell Smith and Victor Mapes.

The beautiful decorations designed for Granville Barker's productions by the American artist, Robert E. Jones, and the English artists, Albert Rothenstein and Norman Wilkinson, started a new fashion in America, which has been continued by the Viennese, Josef Urban, and the American, Robert McQuinn. The work of the Chicago artist, William Penhallow Henderson, should also be mentioned. Mr. Henderson's chief contribution was the investiture of Alice Gerstenberg's charming dramatization of *Alice in Wonderland*.

Late in the spring, Granville Barker turned his attention to the production of two plays by Euripides, *The Trojan Women* and *Iphigenia in Tauris*, both translated by Gilbert Murray. These plays were given out of doors, in the Yale Bowl, the Harvard Stadium, the Princeton Stadium, the Stadium of the College of the City of New York, and in other large open-air auditoriums. Each performance was attended by from 7000 to 10,000 people; and the enthusiasm of these enormous audiences afforded ample proof that Greek tragedy is still a living art. During the summer, Margaret Anglin was no less successful in producing certain plays by both Euripides and Sophocles in the Greek Theatre at Berkeley, Cal.

Next to these events, the most interesting undertakings of the year were still of the sort that is usually called irregular. The eminent German actor and stage-director, Emanuel Reicher, came to New York early in the year and organized a society called The Modern Stage for the production of several masterpieces of the modern drama. During the course of the season, he exhibited Hauptmann's *Elga*, Ibsen's *John Gabriel Borkman*, Björnson's *When the Young Vine Blooms*, and Hauptmann's *The Weavers*. In acting the part of Borkman, Mr. Reicher made his first appearance in the English language.

A very interesting movement was initiated at the Bandbox Theatre in New York by an enthusiastic group of amateurs calling themselves the Washington Square Players. Their policy is to produce a repertory of one-act plays, four plays to each bill, at the small charge of fifty cents a seat. Their plays are adequately acted, beautifully decorated, and well produced; and their repertory includes already such interesting items as Maeterlinck's *Interior*, Schnitzler's *Literature*, Bracco's *The Honorable Lover*, and *Helena's Husband*, a delightful satire by an American author, Philip Moeller. The work of

the Washington Square Players is symptomatic of a movement that is being taken up in many other cities of America.

In the commercial theatre, Grace George successfully established a repertory company at The Playhouse, in New York. Her first two offerings were revivals of *The New York Idea*, by Langdon Mitchell, and *The Liars*, by Henry Arthur Jones. These were followed by the first American production of *Major Barbara*, by Bernard Shaw, a very witty comedy that had been written as long ago as 1905. Mention should also be made of the installation of a Théâtre Français, at the Berkeley Theatre in New York, where excellent performances of standard French plays were given, in the French language, under the direction of Lucien Bonheur.

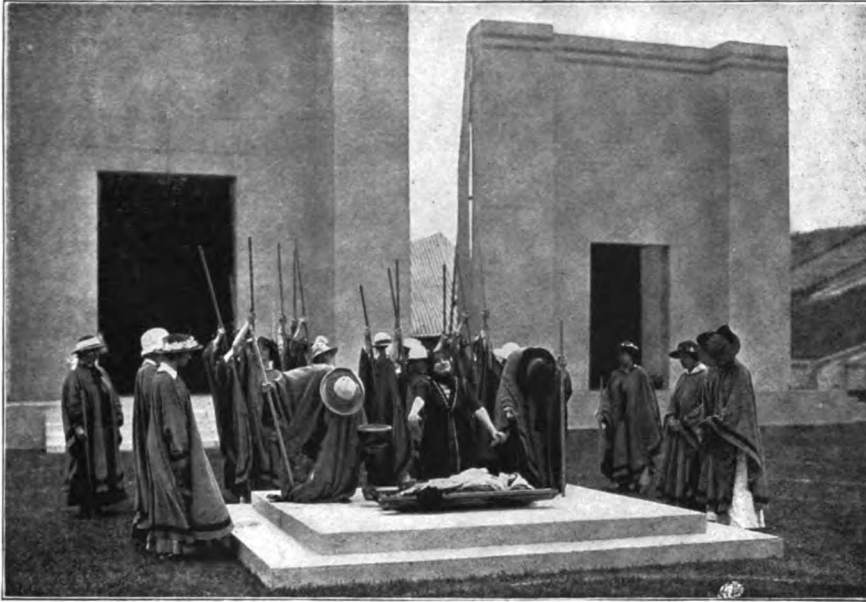
Comparatively few new plays of English authorship were presented in America during the course of the year. The best of these were a Lancashire comedy by Harold Brighouse, entitled *Hobson's Choice*, and a comedy of Yorkshire character, entitled *Quinneys*, by Horace Annesley Vachell. Both of these were excellent examples of that racy type of realistic comedy that has been growing up, in recent years, in the British provinces. Alfred Sutro was represented by a clever satiric comedy, *The Two Virtues*, developed from the theme that charity is no less to be desired in a woman than chastity, and by a less successful satire, *The Clever Ones*, which discussed the same theme as *Les Femmes Savantes* of Molière. A new comedy by Henry Arthur Jones, entitled *Cock o' the Walk*, received its first production in America. The material was rather thin, but it was handled with the author's customary skill. It poked fun, in an airily satiric spirit, at the conduct of the theatre-system in London at the present time, with special reference to the coming centenary celebration in honor of Shakespeare.

The most serious, and perhaps the most important, American play of the year was *Children of Earth*, by Alice Brown, which won the prize of \$10,000 which had been offered by Winthrop Ames. It presented a profound study of New England character, and was extremely searching in its psychological analysis; but it failed to interest the public, because its atmosphere was rather gloomy, and because it lacked rapidity of action. *The Shadow*, by Dario Niccodemi, was not of American authorship, but it received its first and only production in America. It was made memorable by the very impressive tragic acting of Ethel Barrymore. Louis K. Anspacher, in *The Unchastened Woman*, presented a very interesting study of a woman of the Hedda Gabler type, who took delight in devastating the lives of all with whom she came in contact. An earlier play by the same author, entitled *Our Children*, was much less valuable. A new writer, Cleves Kinkead, achieved a great success with *Common Clay*, a play more notable for its evident sincerity and earnestness than for its structural development. It discussed the theme that society, in reference to sins of sex, is harder on the woman than on the man, and harder on the poor than on the rich. In *The Eternal Magdalene*, another new writer, Robert McLaughlin, pleaded for greater sympathy toward those unfortunate women who have been required, by the constitution of society, to adopt the oldest profession in the world; but his play was unimaginative and was poorly written.

Considerable delicacy of art was displayed by Charles Kenyon in *Husband and Wife*; but the play failed because the subject-matter was lacking in novelty. Herman Sheffauer's *The New Shylock*, which had been previously produced by Miss Horniman in Manchester, was brought out in New York under the title of *The Bargain*; but, despite the fact that it presented an interesting characterization of a patriarchal Jew, it failed because the plot was badly proportioned. Paul Kester contributed a slight but charming comedy called *Beverley's Balance*, which was delightfully performed by Margaret Anglin. Edward Locke came forward with two plays—a very agreeable comedy of character, called *The Bubble*, and a rather unpleasant study of a runaway wife, entitled *The Revolt*. In *Sinners*, Owen Davis returned to the manner of the cheap melodramas of his earlier career. *The House of Glass*, a successful melodrama by a new author, Max Marcin, developed with considerable skill the conventional story of an innocent woman hounded and haunted by the police. Jules Eckert Goodman, after failing with *The Trap* and *Just Outside the Door*, came forward at the close of the year with an admirable dramatization of *Treasure Island*. In fact, the thoroughly successful transference of Stevenson's great story to the stage was one of the memorable events of the season.

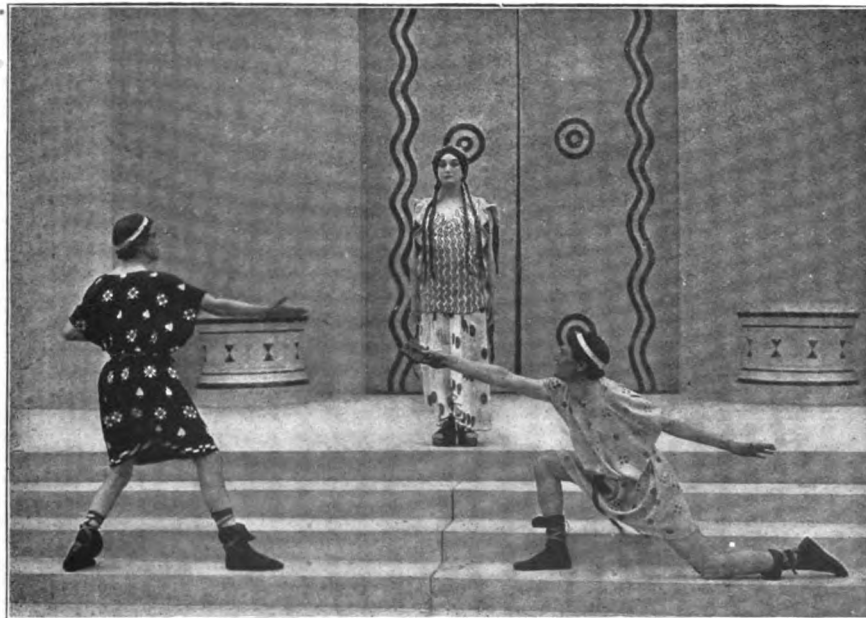
Among the lighter American plays of the year, the most original was *Young America*, by Fred Ballard, a charming comedy of the juvenile court, in which a naughty little ragamuffin was reclaimed by his love for his dog. James Forbes displayed his usual humor in a merry farce about the theatre, entitled *The Show Shop*. Somewhat analogous was a sentimental comedy that dealt with life in and about a metropolitan opera-house: it was entitled *The Great Lover*, and was written by Leo Ditrichstein and Frederic and Fanny Hatton. The successful campaign of the evangelist, Billy Sunday, was turned to the uses of farce by George M. Cohan in *Hit-the-Trail Holiday*. In *Rolling Stones*, Edgar Selwyn added another to the long list of American plays in which a penniless hero makes a fortune in two hours. Avery Hopwood, a deft and witty writer of entertaining farces, scored a great success with *Fair and Warmer*, and was only a little less successful with *Sadie Love*. In *Abe and Mauruss*, Montague Glass and Roi Cooper Megrue wrote a successful sequel to the earlier play of *Potash and Perlmutter*, which had been written by Mr. Glass and the late Charles Klein. *Abe and Mauruss* was not only, like its predecessor, rich in characterization; it was also a well-made play. So much, however, could not be said for *Our Mrs. McChesney*, a somewhat analogous comedy taking up American business-life, by George V. Hobart and Edna Ferber.

The year was marked by a notable increase in the number of published plays: and most of these were real plays—that is to say, plays devised to be presented by actors on a stage before an audience—instead of closet-dramas, merely written to be read. The institution of the *Drama League Series of Plays* and the *Modern Drama Series* appears to have stimulated the further publication of good translations of the best European dramas, and also of good plays of native authorship. An especially useful book was Thomas H. Dickinson's collection of 20 com-



Underwood and Underwood, N. Y.

"THE TROJAN WOMEN"
A Rehearsal in the Yale Bowl



"IPHIGENIA IN TAURIS"
Pylades presents the tablet to Orestes
REVIVAL OF GREEK TRAGEDY IN AMERICA

plete plays, entitled *Chief Contemporary Dramatists*.

The study of the drama was also encouraged by the publication of several very valuable studies in contemporary stagecraft. Among these new books, mention must be made of: *The Theatre of To-day*, by Hiram Kelly Moderwell; *The New Movement in the Theatre*, by Sheldon Cheney; *The Modern Drama*, by Ludwig Lewisohn; *Aspects of Modern Drama*, by Frank Wadleigh Chandler; *The Changing Drama*, by Archibald Henderson; and *How to See a Play*, by Richard Burton.

DRAMA IN EUROPE. See FRENCH, GERMAN, ITALIAN, SCANDINAVIAN, and SPANISH LITERATURE.

DREADNOUGHT. See BATTLESHIPS.

DREAMS. See PSYCHOLOGY.

DREISER, THEODORE. See LITERATURE, ENGLISH AND AMERICAN, Fiction.

DRY DOCK. See DOCKS AND HARBORS.

DU BOIS, AUGUSTUS JAY. American civil engineer and educator, died Oct. 19, 1915. He was born in Newton Falls, Ohio, in 1849, and graduated from the Sheffield Scientific School in 1869, later studying mechanics in Germany. In 1875 he was appointed professor of civil and mechanical engineering at Lehigh University, holding this position for two years, when he was made professor of mechanical engineering at Sheffield Scientific School, becoming professor of civil engineering at that institution in 1884. He published several books on engineering subjects, including: *Elements of Graphical Statics* (1876); and *Elements of Mechanics* (three volumes, 1893-95). He edited and translated important engineering works from the German. He also contributed numerous articles to technical journals concerned with the relation of science to the spiritual and supernatural.

DUNKARDS, or DUNKERS. See BRETHREN, CHURCH OF THE.

DURNOVO, PETER NIKOLAIEVICH. Russian statesman, died Sept. 24, 1915. He was of a noble family of the Province of Chernigoff, and first became prominent while minister of the interior, during the repressions that followed the "Charter of Liberties" granted by Alexander III. He entered the government as an official of the interior department, later joining the police department, of which he finally became head. Following scandals in the department, he was dismissed, and for a time disappeared from sight, emerging as governor of one of the Volga Provinces under Nicholas II. He was made head of the department of posts and telegraphs shortly before the Russo-Japanese War. When Plehve was killed, he was appointed minister of the department of the interior to take the latter's place, resigning in May, 1906, as a result of disloyalty which, Witte declared, Durnovo showed toward him. He later became a member of the Council of the Empire, and in March, 1911, in company with Trepoft, was suspended from all sittings of the Council until January, 1912, at the instigation of Premier Stolypin.

DUTCH EAST INDIES. Possessions of the Netherlands, lying between Australia and the Asiatic continent. Capital, Batavia.

AREA AND POPULATION. The Dutch East Indies consist of two main divisions: (1) Java (16 residencies) and Madoera (1 residency); and (2) the outposts (17 provinces). Area and population (for the outposts approximate) of

Java, Madoera, and the outpost provinces at the end of 1905 are given in the table below:

	Sq. m.	Pop.
Java	48,686	28,604,719
Madoera	2,090	1,493,289
<i>Outposts</i>		
<i>Island of Sumatra:</i>		
Sumatra, West Coast	31,788	.....
Padang Highlands .....	.....	408,431
Padang Lowlands .....	.....	905,040
Tapanceli .....	.....	413,801
Benkoelen	9,437	204,269
Lamong Districts	11,838	156,518
Palembang	53,718	796,354
Sumatra, East Coast	35,481	568,417
Atjeh	20,550	582,175
Riouw *	16,379	112,216
Banka	4,473	115,189
Billiton	1,869	36,858
Borneo, West District	56,061	450,929
Borneo, South and East Districts	157,587	782,726
<i>Island of Celebes †</i>		
Celebes	49,600	415,499
Menado	22,177	436,406
Amboina †	19,870	299,004
Ternate †	176,598	370,902
Timor	17,782	308,600
Bali and Lombok	4,063	523,535
Total	739,547	37,979,377

* Consists of Indragiri in Sumatra and the Riouw and Lingga archipelagoes. † Included in Ternate are a part of eastern Celebes Island, Dutch New Guinea, and a part of the Moluccas; the rest of the Moluccas are in Amboina. Dutch New Guinea extends to 141° E., with estimated area 152,428 square miles and estimated population 262,000.

The native population (exclusive of New Guinea) numbered 37,020,460 (Java and Madoera, 29,715,908); Europeans, 80,910; Chinese, 563,449; Arabs, 29,588; Orientals, other than natives, 22,970. Batavia had 138,551 inhabitants; Semarang, 96,600; Pekalongan, 41,719; Djokjakarta, 118,378; Padang, 91,440; Palembang, 60,985; Bandjermasin, 16,708.

PRODUCTION. Area (1912) under rice, 3,342,084 bahoes (1 baho = 1¼ acres); production, 85,514,914 piculs; sugar cane, 281,994 (sugar production, 21,562,047 piculs); tobacco, 262,736; indigo, 14,583; other cultures, 3,704,660. Government coffee plantations (Java), 59,526 bahoes (production, 81,000 piculs); production from emphyteutic lands, 272,000; from private estates, 29,000. Tobacco: 30,673,631 kilos in Java, and 19,965,896 in Sumatra. Tea (Java), 29,412,704 kilos; cacao, 2,272,953 kilos. Tin from the government mines at Banka in 1911-12, 250,496 piculs; from private mines (as Billiton and Riouw), 76,914; total tin production, 1912-13, 20,219 tons. Coal production (1912), 673,121 metric tons; petroleum, 1,518,044 tons. Gold, silver, diamonds, copper, and manganese are mined.

COMMERCE. Government and private trade, merchandise and specie, are given for three years (in florins):

	1908	1912	1913
<i>Imports</i>			
Government:			
Merchandise ..	7,667,549	20,229,755	27,021,000
Specie	8,850,000	5,170,000	4,419,000
<i>Private:</i>			
Merchandise ..	243,544,983	380,669,597	437,903,000
Specie	20,499,027	29,553,007	23,998,000
Total	280,561,559	435,622,359	493,341,000
<i>Exports</i>			
<i>1912</i>			
<i>Government:</i>			
Merchandise ..	16,856,649	51,411,500	51,231,000
Specie .....	.....	609,072	.....

Exports	1908	1912	1913
Private:			
Merchandise	452,823,832	533,617,014	620,504,000
Specie	1,084,623	1,410,614	6,211,000
Total	470,714,604	587,048,200	688,946,000

The Netherlands is the important country of destination for exports, which consist mainly of sugar, coffee, tea, indigo, cinchona, tobacco, copra, and tin. A large export of rice goes to Borneo and China. There were entered at the ports in the 1913 trade, 6253 steamers, of 5,046,000 tons, and 2664 sailing vessels, of 192,000.

Railways in operation (1913), 1721 miles; government telegraph and cable lines, 12,319 miles.

FINANCE, ETC. Estimated revenue, 1915, 309,429,094 florins (1914, 295,229,458); expenditure, 338,440,625 (338,774,555). A. W. F. Idenburg was appointed governor-general, Aug. 20, 1909.

DUTCH GUIANA, OR SURINAM. A colony of the Netherlands (between 46,000 and 49,000 square miles) on the northern coast of South America. Population (1910): 913 Europeans, 7894 Dutch East Indians, 19,683 British East Indians, 52,369 indigenous, 3643 other; total (exclusive of negroes in interior forests), 86,233. Of these, 36,480 are classed without occupation. Total at the end of 1913, 86,134. Immigrants employed under contract on plantations, Dec. 31, 1910, 11,561. Sugar production, 1912, 9,634,400 kilos (1910, 12,015,100); molasses, 197,100 litres (164,100); rum, 989,900 litres (797,800); cacao, 864,000 kilos (1,683,000); coffee, 196,900 kilos (202,300); corn, 1,290,600 kilos (1,323,000); rice, 2,659,300 kilos (1,993,700). Gold yield, 743,199 grams (1,081,476), valued at 1,081,183 florins (1,481,622); gold export, 981,588 florins (1,446,073). Total imports, 1912, 7,494,063 florins (1910, 424,698); exports, 6,619,937 (8,345,447). Tonnage entered, 211,214. Revenue and expenditure (provisional), in 1914, 6,262,000 and 7,052,000 florins, respectively; subvention, 790,000.

DUTCH REFORMED CHURCH. See REFORMED CHURCH IN AMERICA.

DUTCH WEST INDIES. See CURAÇAO and DUTCH GUIANA.

DYCHE, LOUIS LINDSAY. American zoölogist, educator, and explorer, died Jan. 20, 1915. He was born at Berkeley Springs, W. Va., in 1857, and graduated from the University of Kansas in 1884. After post-graduate studies at that university, he was appointed assistant professor of zoölogy in 1885, becoming in the following year professor of comparative anatomy, in 1890 professor of zoölogy and curator of birds and mammals, and in 1900 professor of systematic zoölogy and taxidermy. He made over twenty scientific expeditions; hunted all over North America from Mexico to Alaska; and was a nimrod also, in Greenland and the Arctic regions. These activities resulted in one of the largest and finest collections of North American mammals in the world. It became the property of the University of Kansas. He was the author of many articles on the subjects that chiefly interested him in scientific publications and other periodicals.

DYNAMO-ELECTRIC MACHINERY. While there was only a slight increase in the capacity of the largest electric generators built in 1915 over those constructed in the previous years, large, high capacity machines were built

in greater quantity. At the close of the year an order for a 45,000 K. V. A. turbo-unit was announced, this being the largest ever constructed. The 35,000 K. V. A. generating set mentioned in the 1914 YEAB BOOK as being installed by the Philadelphia Electric Company was put in service early in 1915. In New York City, the substitution of turbine for reciprocating engine-driven generating sets was continued by the New York Edison and Interborough Rapid Transit Companies, the last named replacing, on the same floor space, four 7500 K. V. A. engine-driven units with three turbo generator sets, each one of which had a rating equal to that of all four old units combined, thus trebling the station capacity without enlarging the building.

Near Newark, N. J., the Public Service Corporation, supplying light and power throughout a large territory in that part of the State, was completing during the latter part of the year a power station in which the initial installation comprised two 25,000 kilowatt sets. The Detroit, Mich., Edison Company was building a power plant at Conners Creek, designed to comprise six 25,000 kilowatt units. In Toledo, Ohio, the Toledo Street Railways and Light Company started the operation of a 20,000 kilowatt generator in the Water Street station. This company also began the remodeling of its Detroit Avenue station, substituting turbo-generator units for engine-driven sets so as to secure a larger power output from the same floor space. The Chicago Edison Company ordered a turbo-generator set of 35,500 K. V. A. capacity of a type similar to those installed by this company recently, consisting of a Parsons type steam turbine directly connected to a three-phase 60-cycle alternating current generator. At Detroit, Mich., the Ford Motor Car Company put into use early in the year the largest continuous current generator ever built. It had a normal rating of 3750 kilowatts with a maximum capacity of 4500 kilowatts. Its armature was about 16 feet in diameter, and weighed 42½ tons. The largest generators ever built for operation by water turbines were those installed during the year at Rjukan, Norway, and near Spokane, Wash., the former being rated at 17,000 K. V. A., and the latter at 13,900 K. V. A.

There was little change in the design or size of alternating current motors installed for industrial uses during the year, and while for mill and factory purposes the induction motor was the commonest type, there were many cases where the synchronous machine was preferred by engineers. A new field for the application of induction motors was opened by the satisfactory performance in service of motors of this kind for the "split phase" system on the Norfolk and Western Railway electric locomotives. (See ELECTRIC RAILWAYS.)

The United States Navy Department began the installation in the superdreadnought *California* of two steam turbo-generator units for furnishing energy to four electric propelling motors, the largest electric ship propelling plant ever built. The two generating sets were designed for a capacity of 37,000 horse power in order to furnish energy for operating the ship at 22 knots speed. The propeller motors were rated normally at 7500 horse power and were to operate at 4000 volts with 25 cycle, quarter phase alternating current, being so wound that connection can be made for using either 24 or 36 poles. The ob-

ject of this was to secure more economical operation at cruising speeds of 15 knots or less, as under these conditions only one generator will be required and the motors will be on the 36-pole connection, and it was expected that even under these conditions the ship would be able to make 18.5 knots per hour. The exciting generator units of 300 kilowatts each were also to be turbine driven. See also **BATTLESHIPS**.

DYESTUFF. See **CHEMISTRY, INDUSTRIAL**.
EARTH, AGE OF. See **GEOLOGY**.

EARTHQUAKES. Central Italy was visited by a heavy earthquake on Jan. 13, 1915, which proved to be one of the most disastrous occurrences of recent record, as measured by the loss of life, which was placed at over 30,000. The devastated region included the mountain districts of the Abruzzi, with the epicentral tract close to the city of Avezzano, where about 90 per cent of the 11,000 inhabitants were reported to have been killed. Pescina had 4500 victims, and some of the villages in the vicinity were literally wiped out, only piles of debris remaining to mark their sites. In completeness of devastation the earthquake probably has had no equal within recent times, although the loss of life was not so large by half as in the Messina disaster. The area of damage extended across the peninsula from Rome on the west, to Chieti on the Adriatic side, a distance of 110 miles, and from Ancona, Perugia, and Grosseto on the north, to Naples and Potenza on the south, in all an area of 56,000 square miles. The main shock was followed by two lighter ones in rapid succession; and minor disturbances were felt for several days, as many as 120 having been recorded at Rome in the first 48 hours. Despite its destructiveness, the disturbance was not of extraordinary violence in the estimation of seismologists; the great loss of life was rather the result of the poor type of construction of the buildings in that part of Italy, the houses being built mainly of stones joined with a little cement. Heavy shocks have not been common there, as the region lies to the north of the main seismic zone in which they usually originate.

Otherwise the year's record was uneventful, although mention may be made of one or two occurrences that possessed local interest. A moderate shock was felt in Southern California, Western Arizona, and the adjacent part of Mexico, arousing some apprehension for the safety of the great irrigation system of the Imperial Valley, which, however, was only slightly damaged. The few fatalities were confined to the Mexican town of Mexicali and were incident to the collapse of buildings. Current opinion seemed to have connected the disturbance with a reopening of the San Andreas fault, in the same way as the San Francisco disaster may be traced to a slipping of the earth on opposite sides of that fracture. There was really no basis for such a view, however, for the fault, so far as can be seen, terminates in Ventura County and lies close to the coast throughout its extent. Slight tremors were reported on December 7th from various parts of the Mississippi Valley from Illinois south to Tennessee and Arkansas.

EAST AFRICA PROTECTORATE. The territory lying between the Umba and Juba rivers, from German East Africa to Italian Somaliland and Abyssinia, and inland to Uganda; a British dependency. Estimated area, about 200,000 square miles, inclusive of coast territory

leased from the Sultan of Zanzibar. The population is estimated at about 4,000,000, including about 25,000 Asiatics and 3500 Europeans. Mombasa, the largest town and chief port, has a population of about 30,000 (230 Europeans). Nairobi (14,000 inhabitants, of whom about 800 are Europeans, and over 3000 Indians) is the administrative headquarters and the central station of the Uganda Railway. At Kilindini improvements are in progress that will make it the finest harbor on the east African coast and the centre of trade for equatorial Africa. In 1912, of the 338,033 acres (9844 freehold, 328,189 lease) classed as productive, 310,145 were devoted to grazing, 27,888 to crops. Cattle, sheep, and ostriches are raised. The crops include grains, coconuts, cotton, sisal, rubber, tobacco, coffee, and fruits. The worked mines yield carbonate of soda, limestone, graphite, and gold. The cost of construction of the Uganda (Mombasa-Victoria) Railway (602 miles) to March 31, 1914, was approximately £6,289,917. Four steamers are operated on Victoria Nyanza in connection with the railway. Railway passengers carried (1913-14), 616,197; tons of goods, 189,556; revenue, £546,345; expenditure, £322,861. The telegraph system, exclusive of the lines in Uganda, has 2302 miles of line (the railway line has three wires). Commercial and financial figures follow:

	1908-9	1909-10	1910-11	1913-14
Imports ..	£ 797,158	£ 775,246	£1,000,846	£2,147,937
Exports ..	436,818	590,057	962,911	1,482,876
Revenue ..	485,668	503,089	609,585	1,123,789
Expenditure	703,103	669,404	682,041	1,115,899
Gr't-in-aid.	138,000	133,500	130,000	.....
Shipping *	1,838,159	1,914,153	1,364,740	1,791,081

* Tonnage entered at Mombasa and Kilindini.

The import figures are exclusive of railway material, government stores, and specie. The United Kingdom supplied imports to the value (1913-14) of £907,410, and received exports valued at £686,643; British possessions, £433,337 and £118,451; Germany, £194,514 and £219,523; the United States, £170,864 and £95,976; the Netherlands, £101,050 imports; France, £207,414 exports.

EASTLAND DISASTER. See **SAFETY AT SEA**.

ECONOMIC ASSOCIATION, AMERICAN. The twenty-eighth annual meeting of the association was held at Washington, D. C., from Dec. 27 to 30, 1915. The American Historical Association, the American Statistical Association, the American Sociological Society, the American Political Science Association, the American Association for Labor Legislation, the Nineteenth International Congress of the Americanists, the American Society of International Law, the Naval History Society, the American Folk-Lore Society, the American Anthropological Association, the Archaeological Institute of America, and the Mississippi Valley Historical Association also held their annual meetings at the same place and time. Among the papers and addresses were the following: "Probable Changes in the Foreign Trade of the United States Resulting from the European War," by Emory R. Johnson; "The Value of Archives to the Student of Economics," by Frank W. Taussig; "The Apportionment of Representatives," by Walter F. Wilcox; "The Economic Costs of War," by John Bates Clark

and W. S. Rossiter; "Economic Theorizing and Scientific Progress," by J. H. Hollander. Papers or speeches were also given by G. Hunt, B. F. Shambaugh, Waldo G. Leland, Leo F. Stock, Louis A. Simon, W. M. Stephens, B. H. Meyer, W. C. Mitchell, Willard Straight, and G. E. Roberts. The officers of the association for 1915: Walter F. Wilcox, of Cornell University, president, and Allyn A. Young, of Cornell University, secretary and treasurer.

ECONOMICS, HOME. See **FOOD AND NUTRITION.**

ECONOMICS, SOCIAL. See **SOCIAL ECONOMICS.**

ECUADOR. A South American republic between Colombia and Peru. Capital, Quito.

AREA AND POPULATION. The eastern limits of the republic are not definitely established, but, pending a settlement of the boundary disputes with Colombia and Peru, the area is stated at 299,600 square kilometers (115,676 square miles); or, including the Galápagos (about 730 miles off the coast), 307,243 square kilometers (118,627 square miles). The republic is divided into 17 provinces. The population in 1903 was placed at 1,272,000; an estimate of 1910 is 1,500,000. The majority of the people are Indians, and there are perhaps 400,000 mestizos; the proportion of pure white inhabitants is very small. Much uncertainty exists in respect of urban population; Guayaquil is supposed to have upwards of 80,000 inhabitants; Quito, about 70,000; Cuenca, over 40,000; Riobamba, about 18,000; Puertoviejo, Ambato, Loja, and Ibarra, each about 10,000.

EDUCATION. Illiteracy is prevalent, though primary instruction is free and nominally compulsory. A report of the minister of public instruction, published in 1915, gave the number of primary schools as 1231, with an enrollment of 95,019. State schools numbered 1054, with 72,655 pupils; municipal schools, 92, with 12,009 pupils; and private schools, 85, with 10,355 pupils. For secondary instruction there are 12 institutes supported by the government, besides commercial and technical schools at Quito and Guayaquil. For higher and professional education there are universities at Quito, Guayaquil, and Cuenca. There is also a law college at Loja. The state religion is Roman Catholicism.

PRODUCTION AND COMMERCE. The most important crop is cacao, for which Ecuador supplies a large part of the world's demand, though the proportion is smaller than formerly; the average Ecuadorean output has not declined, but that of other countries, notably Brazil, has in recent years increased. In 1913, 85,908,495 pounds of cacao were delivered at the port of Guayaquil; the quantity sent to other ports for shipment is comparatively small. Other products of account are coffee, rice, sugar cane, tobacco, ivory nuts, and rubber. The rubber industry has suffered from the thriftless exploitation of the trees. A large part of the ivory nuts was taken by Germany, and the export of that product declined upon the outbreak of the great German war. Ecuador has valuable mineral resources, but they have not been largely exploited. Manufactures have little commercial importance, except Panama hats, which are produced in large numbers.

The reported value of imports and exports, respectively, in 1911, was \$11,489,104 and \$12,692,237; in 1912, \$10,354,564 and \$13,689,696;

in 1913, \$8,836,689 and \$15,789,367; in 1914, \$8,402,767 and \$13,061,566. The principal imports are cotton and woolen fabrics, foodstuffs, hardware, machinery, wines and liquors, ready-made clothing, etc. The chief export is cacao; other exports of some importance are Panama hats, ivory nuts, rubber, gold, and cattle hides. Trade by principal countries, in thousands of dollars:

	Imports		Exports	
	1912	1913	1912	1913
United Kingdom	3,058	2,618	2,042	1,620
United States	2,687	2,818	3,957	3,834
Germany	2,105	1,563	1,523	2,827
France	616	435	4,097	5,382
Total, including other	10,355	8,837	13,690	15,789

COMMUNICATIONS. The length of railway in operation in 1912 was about 370 miles; of this, 297 miles are comprised in the line from Durán (opposite Guayaquil) to Quito. This line was opened in June, 1908, and since has been worked at a heavy loss, in fact not earning interest upon its bonds, so that the track cannot be maintained in a proper state of repair, and breakdowns and serious accidents are of frequent occurrence. Previous to the outbreak of the European war a German firm secured a contract from the government to build a line from Huigra to Cuenca, and this would have had considerable effect on the prosperity of the country. A railway (19 miles) extends from Puerto Bolívar to Machala, Pasaje, and Guabo. There are under construction: a line from Manta, on the coast, to Santa Ana; a line from Bahía de Caraquez to Quito; a line from Ambato to Curaray; and a coastal line from Guayaquil to Salinas. At the end of 1912, there were 3318 miles of telegraph line, with 188 offices. There are six radiotelegraph stations. Post offices, 151.

FINANCE. Gold is the standard of value. The sucre is the monetary unit; it has a par value of 48.665 cents, being one-tenth of the Ecuadorean condor or of the British sovereign. Revenue and expenditure are reported as follows, in thousands of sucres (the figures for 1915 are estimated):

	1911	1912	1913	1914	1915
Revenue	13,264	19,973	20,140	20,996	20,880
Expenditure	15,836	19,950	21,503	20,760	20,880

The chief items of revenue are import duties (8,155,620 sucres in 1912) and export duties (4,598,408). The larger disbursements in 1912 were: for the public debt, 6,927,348 sucres; war and marine, 3,411,810; public instruction, 1,844,698; interior and police, 1,561,325. Public debt, Jan. 1, 1914: foreign, 28,027,400 sucres; internal, 14,114,420; total, 42,141,820.

GOVERNMENT. The executive authority is vested in a President elected by direct vote for four years. He is assisted by a cabinet of five ministers. The Congress consists of two houses, the Senate (32 member, elected for four years) and the Chamber of Deputies (48 members, elected for two years). For the term beginning Aug. 31, 1911, Emilio Estrada was inaugurated President in succession to Gen. Eloy Alfaro. The death of Estrada, Dec. 21, 1911, was followed by a revolutionary outbreak headed apparently by friends of Alfaro (who was killed). On March 31, 1912, the commander of the government forces, Gen. Leonidas Plaza, was elected

President, and on the 31st of August following was inaugurated for a four-year term. Plaza was President in 1901-05.

HISTORY. *End of the Revolution.* The revolution in Ecuador which began in December, 1913, under the leadership of Col. Carlos Concha was thought to have reached an end late in February, when Colonel Concha was captured near Esmeraldas. A report to the State Department in Washington stated that the government "considers this of great importance and that it means the collapse of the revolutionary movement." (See YEAR BOOK, 1914.)

Political and Economic Conditions. Ecuador was represented at the Pan-American Financial Conference, in Washington, in May, by E. Gallardo and V. Gonzales. The principal duty of these delegates was to acquaint the members of the Conference with facts concerning the Guayaquil and Quito Railroad, an American-owned line, which had failed to make several payments of interest on bonds. These bonds were owned mainly by European investors who, as security, held a lien on the entire customs receipts of the country. Ecuador claimed that it was experiencing difficulty with the line and could not make it pay the interest. The committee appointed by the conference to consider the matter accepted the report made by the Ecuadorean delegates. The war in Europe brought about a deficit in the revenues of Ecuador estimated at \$2,000,000. In order to make up this deficit the government endeavored to establish a market in the Western Hemisphere for Ecuadorean products. In July an effort was made to encourage trade between Chile and Ecuador by an exhibit of Chilean goods at Quito. An executive decree convened Congress on August 10th. The session was chiefly concerned with measures to improve the economic condition of the country.

EDISON BATTERY. See ELECTRIC BATTERIES.

EDUCATION. See section so entitled under various foreign countries and under States of the United States.

EDUCATION IN THE UNITED STATES. **STATISTICS.** *Attendance in Elementary and Secondary Schools.* The latest report of the United States Commissioner of Education gives the statistics for the year 1913. It shows that there were in the elementary schools, including kindergarten, primary, and grammar grades, a total of 19,084,787 pupils. Of this number, 17,474,269 were in public, and 1,590,518 in private, schools. There were 1,134,771 secondary students in public institutions, and 148,238 in private schools. There were also 83,813 secondary students in the preparatory departments of higher institutions. In miscellaneous schools of elementary and secondary rank there were 839,634 students. A total of 21,271,243 students received formal instruction in elementary or secondary subjects during 1913. Compared with the total population of the country, in each thousand persons 196 were in the elementary school and 14 were in the high school. The public provided instruction for 180 of the 196 elementary pupils and for 12 of the 14 high school students.

The length of school term varied from 91 days to 194 days. The average for all of the States was 158 days. The average number of days' attendance in public schools for each child between the ages of 5 and 17 years inclusive varied from 41 days in South Carolina to 112

days in California. The average for the whole country was 84 days. All but three States, Georgia, Mississippi, and Alabama, now have compulsory school attendance laws. In Idaho the compulsory attendance age is from 8 to 17 years inclusive. In a few States the limits are from 7 to 15 years, in others from 8 to 15. The minimum period of compulsory attendance each year varies from 24 weeks to the full school year.

Of each thousand pupils in the elementary school 235 were in the first grade, 150 in the second, 139 in the third, 133 in the fourth, 112 in the fifth, 92 in the sixth, 76 in the seventh, and 63 in the eighth. The number registered in the first grade does not represent the number who are beginning school. It is usually estimated that one-half of the first grade enrollment is composed of those who repeat the grade or are retarded. Taking this assumption as the basis, it would seem that less than one child in four who enters the first grade reaches the high school and that only about 109 out of every thousand who enter first grade graduate from the high school.

Teachers in Elementary Schools and High Schools. The public elementary schools employed 89,801 men and 421,944 women as teachers. The public high schools employed 23,412 men and 30,326 women. In addition it is estimated that 41,831 teachers were employed in private elementary schools and 13,358 in private high schools. In three years—1910 to 1913—the number of public elementary school teachers was increased 6 per cent. The increase in number of children enrolled was 5 per cent. During the same time the number of high school students increased 21 per cent but the number of high school teachers increased 29 per cent.

Costs of State Common Schools. The total expenditure for the common schools in 1913 was \$521,546,375, or \$5.37 per capita of total population. Of each \$100 secured for school purposes \$4 came from income of permanent funds or rents, \$15 came from State taxes, \$74 from local taxes, and \$7 from other sources. It cost an average of \$38.31 for each pupil in average attendance. Of this amount \$6.14 was used for sites and buildings, \$22.36 for salaries, and \$9.81 for all other purposes. The per capita cost for high school students during the year ending June, 1914, was \$57.02.

In a recent report of a survey of the San Antonio school system Prof. J. F. Bobbitt presents as an "index of community valuations" some tables which give the costs of teaching various high school subjects. The following table is compiled from data which he presents:

	Cost of instruction in per cents	Cost of instruction per student hour
English Composition and Literature	20.4	6.7
Higher Mathematics	17.0	6.9
The Sciences	13.1	6.8
History and Civics	10.6	8.3
Modern Languages	10.3	11.4
Household Occupations	9.7	8.3
Shopwork and Mechanical Drawing	6.3	10.3
Commercial Subjects	5.3	10.3
Latin	5.2	10.3
Public Speaking	1.9	9.8
Music	.4	4.0
Physical Training	.0	
Drawing and Design (not Mechanical)	.0	
Training of Elem. Teachers...	.0	

The table should be read as follows: San Antonio devotes 20.4 per cent of all the expense of instruction to English composition and literature. For each student it costs 6.7 cents for each hour of instruction in English. Professor Bobbitt implies that because the community is willing to pay 11.4 cents per student per hour for instruction in modern languages and only 6.8 cents for the instruction in sciences they value modern languages more highly than sciences.

BUREAU OF RESEARCH AND EFFICIENCY. In the past four years nine cities have established departments or bureaus of research and efficiency in connection with their public schools. These cities and the dates of the establishment of the bureaus are as follows: Rochester, N. Y., 1911; Baltimore, Md., 1912; New Orleans, La., 1912; New York City, 1913; Boston, Mass., 1914; Kansas City, Mo., 1914; Detroit, Mich., 1914; Oakland, Cal., 1914; Schenectady, N. Y., 1914. In each case the aim is to have a constant investigation of the school system. The following quotation from the annual report of the Superintendent of Schools of Kansas City gives the aims and functions of the bureau established in that city: "The purpose of this bureau is to assist in discovering better methods of administering and supervising our schools, and better methods of teaching the various subjects of the curriculum. It is hoped that such plans and methods may be discovered as will secure the best results from the given factors.

"The plan throughout will be coöperative. . . . It shall be the function of this bureau to bring together the results of efforts at improvements and so tabulate and arrange the data that those interested may know the facts that have been revealed by any investigations that are undertaken and be able to judge in a better way the value of the conclusions reached. A further aim will be to so democratize the school system and so plan the work that the humblest teacher in any grade may contribute the results of her work to the advancement of the system. . . .

"While ill-advised and unorganized experimentation will not be undertaken, much liberty will be allowed in working out problems along safe and conservative lines. . . ."

While the above statement describes in a general way the work of this bureau, we might enumerate specific functions as follows:

First: To measure and tabulate the results that are now being secured in our schools. During the first year we hope to do some work in measuring the results in writing and arithmetic and possibly also in spelling and language.

Second: To study the results of the work of similar bureaus in other cities and bring to Kansas City the best conclusions of those bureaus.

Third: To coöperate in the investigation of any problem that may confront the board of education, the superintendents, the supervisors, the principals, the teachers, or the people.

Fourth: To tabulate and analyze all statistical reports.

Fifth: To study methods of reducing waste in the school system.

Sixth: To study with the principals and the teachers plans for reducing elimination of pupils, non-promotion of pupils, and failures of pupils.

Seventh: To coöperate with all the depart-

ments of the school system in efforts to increase efficiency.

EDUCATIONAL INVESTIGATIONS AND SURVEYS. The Survey Committee of the Cleveland Foundation assisted by the Russell Sage Foundation conducted a very thorough survey of the schools of Cleveland, Ohio. The report of the survey is contained in 25 small volumes which may be obtained either from Cleveland Foundation or from the Russell Sage Foundation, New York. Professor John F. Bobbitt, of the University of Chicago, investigated the schools of San Antonio, Texas. During December, 1915, the city of Boston employed a group of educational experts to investigate the management of the city schools. The report of this investigation is not yet printed. The Carnegie Foundation for the Advancement of Teaching is conducting an exhaustive survey of the teachers' training institutions of Missouri. During the month of May the public school system of Salt Lake City, Utah, was surveyed by a staff under the direction of Ellwood P. Cubberley, Leland Stanford University.

There are evidences that interest in investigations such as have been conducted is decreasing. The recent investigations have failed to develop any new plans of procedure or to suggest specific remedies for defects other than those found in certain administrative matters. The outcome of many of the investigations has been the creation of a distrust on the part of the public for their school officials and teachers. This may be wholesome in the end but the immediate results have in many cases been unfortunate.

INDUSTRIAL EDUCATION SURVEYS. Several cities, notably Richmond, New Orleans, and Minneapolis, have begun or completed very comprehensive investigations of their industries as related to industrial education. After considering such questions as conditions of employment, wages, hours of labor, entrance age, etc., the findings in the Richmond investigation present the education requirements for operatives in the various trades. It shows what the worker needs to properly equip him for the trade, what training the industry gives, common deficiencies of workmen, and ends with suggestions as to what the school ought to give. The industrial survey of Minneapolis seeks to find, first, to what extent the worker can "get on" in his job; second, to what extent the city's industries may give special training which they do not now provide; third, to what extent can the schools be a factor. The National Society for the Promotion of Industrial Education is directing the survey. Dr. Charles A. Prosser, Director of the William Hood Dunwoody Industrial Institute of the city of Minneapolis, is director. The Minneapolis School Board, the Dunwoody Industrial Institute, the Minneapolis Art Institute, and the Civic and Commerce Association are coöperating.

MONTESORI SCHOOLS. Dr. Montessori began her experiments with normal children in Rome in the Case dei Bambini (children's houses) in one of the tenement sections. She had previously experimented with defective children and found that by using methods that developed the senses and by following the child's development she was able to accomplish almost as much with these children as was ordinarily accomplished by the regular schools with normal children. In 1909 she published the outcome of her observations and experiments in a book entitled *The*

Method of Scientific Pedagogy Applied to Infant Education. Her training in medicine and psychiatry enabled her to apply the method of experimental science to the study of education. The following quotation presents in brief form her method: "Give the best conditions of life, and then, as is done with other living organisms, give freedom for development, disturbing as little as possible, observing, certainly helping, by every means, in this development." The distinctive features of the method are an insistence upon sense education and muscular training. She emphasizes freedom for the children and demands that the teacher shall observe them and assist them but not prescribe what shall be done. By the use of various materials which can be used in only one way the child is led to correct himself. This, according to Madame Montessori, provokes "auto-education" and because the material does the teaching she calls it "the didactic material." It is claimed that children learn the ordinary school subjects rapidly and easily after the preliminary training afforded by this method.

The Montessori movement in America began in 1911. From that time on many American teachers and others interested in education visited the Montessori schools in Italy and Switzerland. Miss Anna E. George, who had previously studied and observed in the Montessori schools, translated Madame Montessori's book, and opened a Montessori class in Tarrytown, N. Y., in October, 1911. In 1912 the Montessori American Committee was formed. This committee helped to arrange the first International Teachers' Training course at Rome. Of the 100 students in attendance nearly 70 were Americans. In May, 1913, the National Montessori Educational Association was formed with headquarters in Washington. The purpose is "to promote and develop in America the educational movement based on the principles and theories of Dr. Montessori, and to assist in the establishment and maintenance of schools for children and schools of observation and practice conducted according to said principles." The association now has a membership of more than 700.

Dr. Montessori visited the United States in 1913 and again in 1915. During her last visit she conducted a teachers' training institute in connection with a model class at the Panama Exposition. No available data concerning the number of Montessori schools in America are available. It is certain that a considerable number of teachers have been influenced by her method and in their own work, largely in private schools, have modified their practice in accordance.

ORGANIC EDUCATION. Mrs. John F. Johnson is developing a method of school instruction and organization at Fairhope, Ala., that is now commanding the attention of the school authorities. Schools similar to hers have been established in various parts of the United States. Each summer she conducts a teachers' training course in connection with a model school at Greenwich, Conn. "She calls her methods of education 'organic' because they follow the natural growth of the pupil. The school aims to provide for the child the occupations and activities necessary at each stage of development for his unfolding at that stage. Therefore, she insists that general development, instead of the amount of informa-

tion acquired, shall control the classification of the pupils. Division into groups is made where it is found that the children naturally divide themselves. These groups are called 'Life Classes' instead of grades. The first life class ends between the 8th and 9th years; the second between the 11th and 12th, and since an even more marked change of interests and tastes occurs at the period of adolescence, there are distinct high-school classes. The work within the group is then arranged to give the pupils the experiences which are needed at that age for the development of their bodies, minds, and spirits."

In place of the typical primary curriculum she has the following activities: Physical exercise, nature study, music, hand work, field geography, story telling, sense culture, fundamental conceptions of number, dramatizations, and games. As much as possible of this work is conducted out of doors. In the ordinary school the gymnasium work comes at a time when the child is fatigued with his study. In Mrs. Johnson's school the gymnasium work, which is informal, may come the first thing in the morning. In place of being forced to learn the "three R's," the child is led into reading, writing, and arithmetic by his own desire to know. Mrs. Johnson is not disturbed if a child does not learn to read until he is eight or nine years old.

Mrs. Johnson has not formulated her work into any system, so it is impossible to state the principles by which she works. The best description of her work is found in *Schools of Tomorrow*, by John Dewey.

VOCATIONAL EDUCATION. There was no change during 1915 in the number of States having systems for organizing and supervising vocational schools and for assisting local communities in the maintenance of such schools through grants of State aid. The States having such systems are: Massachusetts, New York, New Jersey, Pennsylvania, Wisconsin, and Indiana. In each of these States administration is effected through the office of a special deputy or expert assistant attached to the staff of the State Superintendent of Public Instruction or Commissioner of Education.

Federal Aid for Vocational Training. The Smith-Lever Act, approved by the President on May 8, 1914, provides for "coöperative agricultural extension work which shall consist of the giving of instruction and practical demonstrations in agriculture and home economics to persons not attending or resident" in the agricultural colleges. The appropriations provided by this act go to the State agricultural colleges which are required to make plans for the work subject to the approval of the Secretary of Agriculture. During the current fiscal year each State had \$10,000 from this fund. The general plan for conducting the extension work consisted in, first, locating extension agents in several counties of the State to carry on demonstrations, advise the agricultural people and stimulate them to better methods; second, the organization of boys' and girls' clubs, largely in connection with the rural schools, to conduct some simple agricultural or home economics project; third, the organization of a staff of specialists in agriculture and home economics as a part of the faculty of the agricultural college. These specialists go about the State and assist the extension agents. Agents are now located in more

than 1000 counties out of the 3000 in the United States.

The Smith-Lever Bill provides "\$10,000 annually to each State for its Agricultural College beginning July 1, 1914. For the year beginning July 1, 1915, it provided \$600,000 additional to be allotted to the various States in the proportion which the rural population of each State bears to the total rural population of the United States; and for each succeeding year for seven years an additional amount of \$500,000 allotted on the same basis. By July 1, 1923, this will amount to an annual appropriation of \$4,100,000 in addition to the \$10,000 to each State. None of this amount will be paid to any State (excepting the \$10,000 annually) unless the State makes an equal appropriation. Both the fund received from the Federal government and the equal fund from the State government to balance it must be expended on extension schemes approved by the United States Department of Agriculture."

The Smith-Hughes Bill for national aid to vocational education was before the Sixty-third Congress and has been reintroduced in the Sixty-fourth Congress. This bill would "provide Federal aid to cooperate with the various States in the maintenance and support of vocational schools of agriculture, home economics, and the trades and industries for persons 14 years of age and over, and in the maintenance and support of schools for training teachers for the vocational subjects in these vocational schools. This would provide vocational education in regular day schools of high school grade and part-time day schools for youths not employed, and in continuation courses in evening schools for youths and adults regularly employed." The following table presents a summary of the proposed grants to be given to the States by the Smith-Hughes Bill:

Year	Toward salaries for agricultural teachers	Toward salaries for trade and industrial teachers	For training of teachers for vocational work	Federal Board of Vocational Education for administration, investigation, studies, etc.	Total for each year
1915-16.....	\$500,000	\$500,000	\$500,000	\$200,000	\$1,700,000
1916-17.....	750,000	750,000	700,000	200,000	2,400,000
1917-18.....	1,000,000	1,000,000	900,000	200,000	3,100,000
1918-19.....	1,250,000	1,250,000	1,000,000	300,000	3,700,000
1919-20.....	1,500,000	1,500,000	1,000,000	200,000	4,200,000
1920-21.....	1,750,000	1,750,000	1,000,000	200,000	4,700,000
1921-22.....	2,000,000	2,000,000	1,000,000	200,000	5,200,000
1922-23.....	2,500,000	2,500,000	1,000,000	200,000	6,200,000
1923-24.....	3,000,000	3,000,000	1,000,000	200,000	7,200,000

The maximum in each case above is continued annually after 1923-24.

EDUCATION, VOCATIONAL. See EDUCATION IN THE UNITED STATES, section *Vocational Education*.

EDWARDES, GEORGE. English theatrical manager, died Aug. 4, 1915. He was born in 1852. In his early years he intended to enter the army, but his associations with the theatre provided the stronger attraction, and he went into the theatrical business. For 10 years, beginning with 1875, he worked under the direction of D'Oyley Carte, then manager of the Savoy Theatre. He then bought out a half interest in the Gaiety Theatre, which soon passed under

his sole control. This theatre was given over to the lighter comedies and burlesques. With the production of *The Gaiety Girl* Mr. Edwardes first introduced that form of entertainment now known as musical comedy. This was followed by a long series of comedies of a like kind, including *The Shop Girl*, *The Artist's Model*, *San Toy*, *The Country Girl*, and *The Geisha*. These musical plays were produced in conjunction with Charles Frohman, and other partners, and were successful in the United States and England. Mr. Edwardes was one of the most widely known managers in England at the time of his death.

EGGS. See AGRICULTURE, sections *The War and Agriculture* and *Eggs*.

EGYPT. A khedivate of northeastern Africa, virtually under the control of Great Britain and nominally under Turkish suzerainty until 1914, when it became a British protectorate. Cairo is the capital.

AREA AND POPULATION. The area, exclusive of the Sudan, is given as 363,181 square miles, of which only 12,013 square miles are settled and under cultivation. The population in 1907 numbered 11,189,978, not including nomadic Bedouins, estimated to number over 97,000. By nationalities the population was made up as follows: 10,903,877 (10,366,046 sedentary, 537,631 nomadic) Egyptians, and 286,381 foreigners, of whom 69,725 Turks, 62,973 Greeks, 34,926 Italians, 20,853 British including Maltese, 14,591 French including Tunisians, 7704 Austrians and Hungarians, 2410 Russians, etc. Mohammedans numbered 10,366,826; Copts, 706,322; Jews, 38,635. In 1907 Cairo had 654,476 inhabitants; Alexandria, 332,246; Tanta, 54,437; Port Said, 49,884; Mehala el Kobra, 47,955; Mansura, 40,279; Assiut, 39,442; Damanhur, 38,752; Fayum, 37,320; Zagazig, 34,999; Damiatta, 29,354; Minieh, 27,221; Sherbin, 25,473;

Akhmim, 23,795; Beni-Suef, 23,357; Menuf, 22,316; Shebin el Kom, 21,576; Mellawi, 20,249; Qena, 20,069.

EDUCATION. In 1910 an important and very interesting experiment was begun, viz., the handing over of local education to the recently constituted provincial councils. This new departure introduced a much-needed elasticity and diversity into the system. The provincial councils became entirely responsible for elementary vernacular education in their districts, and all schools maintained by them are inspected by the ministry of education. The ministry still retains, under its direct control, certain elementary schools belonging to trusts controlled by

the ministry of Waqfs (pious foundations); these schools, or maktabas, numbered 142 at the end of 1913, with an attendance of 14,027. Higher primary schools, 34, with 7610 pupils; provincial council maktabas, 911, with 57,175; private maktabas (grant-in-aid), 3394, with 174,282; provincial council higher primary schools, 78, with 10,493. Total number of establishments under direct management of the ministry of education, 198, with 27,864 pupils; total number of establishments under inspection by the ministry, 4493, with 253,295 pupils. Of the latter total, 227,434 were boys, and 25,861 were girls. A free primary school has been established in Cairo.

AGRICULTURE. The area planted to cotton in 1910 was stated at 1,642,610 feddans, and in 1911 at 1,711,228—an increase of 68,618 feddans. Production, in 1911, of cleaned cotton, 3,318,529 metric quintals. In the table below are shown areas under main crops in feddans (1 feddan = 1.038 acres) in 1913, as distributed in Lower Egypt, Upper Egypt, and the Suez governorate; with the total area for Egypt, and the total yield (cotton and sugar in kantars, other crops in ardebs of 5.44 bushels):

	Lower	Upper	S.G.	Total	Yield
Cotton	1,339,565	383,485	44	1,723,094	7,554,000
Wheat	678,747	626,634	197	1,305,578	6,972,000
Barley	165,785	203,300	73	369,158	2,078,000
Rice	229,149	13,218	...	242,367	1,280,000
Corn	1,173,716	458,471	369	1,632,556	10,350,000
Millet	...	220,204	...	220,204	1,863,000
Sugar	2,199	46,241	28	48,468	21,629,000

Of the 1,723,094 feddans reported as planted to cotton in 1913, 486,600 feddans were attacked by the cotton worm, as compared with 980,300 in 1912. Area reported as planted to cotton in 1914, 737,354 hectares; yield, 3,144,960 metric quintals. Lower Egypt suffered from pink bollworm attacks, but Upper Egypt yielded a good crop.

The area under sugar cane in 1915 was 21,921 hectares, or 108.2 per cent of the area in 1914, which amounted to 20,252 hectares and gave a production of 9,248,429 metric quintals of cane. The amount of sugar cane treated in 1913 was 741,000 tons, as compared with 537,000 in 1912. Amount of sugar cane treated in 1909-10, 515,839 tons (sugar yield, 553,346 metric quintals); 472,344 in 1910-11 (493,942).

Area planted to wheat, 1913-14, 526,453 hectares (preliminary figures for 1914-15, 640,118 hectares), yielding 8,935,297 metric quintals (10,654,389); barley, 161,035 (187,206) hectares, 2,412,234 (2,993,027) quintals; corn, 713,550 (771,904) hectares, 16,954,119 quintals; rice, 14,967 (133,925) hectares, 598,991 quintals.

Much hardship has resulted from the dearth of cattle for plowing in the Delta, disease having carried off a quarter of a million of these animals in seven years. Increase of cotton pests, due to improper drainage and the wholesale destruction of birds, has wrought havoc. Legislation has been enacted for the protection of bird life, and a commission appointed to devise means for the suppression or better control of the cotton worm and bollworm. The government has taken measures for the distribution of improved cotton seed.

COMMERCE. In the following table are given imports and exports of merchandise in thousands of pounds Egyptian:

	1910	1911	1912	1913	1914
Imports	23,553	27,227	25,908	27,865	21,725
Exports	28,944	28,599	34,574	31,662	24,092

Trade with the principal countries of origin and destination is shown in the following table in thousands of pounds Egyptian (£E = \$4.943):

	1910	1911	1912	1913	1914
Imports:					
United Kingdom	7,311	8,557	7,991	8,496	7,061
British pos.*	169	257	253	207	192
British pos.†	967	1,095	1,314	1,762	1,277
France‡	2,708	2,839	2,411	2,518	1,640
Turkey	2,905	2,808	2,754	2,724	1,911
Austria-Hungary	1,647	1,988	1,680	1,941	1,127
Germany	1,262	1,500	1,421	1,609	1,875
Italy	1,169	1,461	1,243	1,473	1,450
Exports:					
United Kingdom	14,343	13,958	16,022	18,648	10,450
British pos.*	10	10	14	13	66
British pos.†	82	111	118	103	168
France‡	2,480	2,816	2,707	2,787	1,571
Austria-Hungary	1,435	1,443	1,431	1,757	960
Germany	3,088	3,117	3,886	4,066	2,299
United States	1,892	2,071	4,121	2,485	2,917
Russia	1,659	1,789	2,056	2,242	1,600

* British possessions in the Mediterranean.

† British possessions in the Far East.

‡ Including Algeria.

By decision of the president of the council of ministers, the export of foodstuffs and products (except for necessary supplies to ships leaving, which demand them) was prohibited after Aug. 3, 1915.

The total export of cotton decreased from £E27,529,300 in 1912 to £E25,513,100 in 1913, and from £E24,241,000 in 1910 to £E22,988,000 in 1911, the United Kingdom taking over £E1,000,000 less than in the previous year. In 1913 the United Kingdom took £E10,996,700, as against £E12,572,200 in 1912; the United States, £E2,442,500, as against £E4,072,200 in 1912. Total export of cotton seed was £E3,294,800, of which the United Kingdom took £E1,698,700, and Germany, £E1,480,704. The cigarette export was £E395,000. Coal arrived to the amount of 1,686,700 tons, valued at £E2,010,000, of which the United Kingdom contributed 1,605,000 tons, valued at £E1,909,700.

The withdrawals of leaf tobacco decreased from 8,206,000 kilograms in 1912 to 8,177,000 in 1913. Russian tobacco advanced from 1,027,000 kilograms in 1911 to 1,511,000 in 1912, and 1,853,000 in 1913. Tobacco in bond decreased from 186,000 bales Dec. 31, 1912, to 167,000 bales Dec. 31, 1913, from the fact that, owing to the disturbed political conditions in eastern Europe, merchants transferred their stocks to Alexandria in 1912.

Steamers entered at Alexandria in the 1913 trade, 1932, of 3,718,660 net registered tons; cleared, 1927 steamers, of 3,698,396. There passed through the Suez Canal in 1913, 4979 vessels, of 19,758,040 net tons.

COMMUNICATIONS. There were 1512 miles of state railway in operation Jan. 1, 1913. In addition there were 795 miles of light railways—the Egyptian Delta Light Railways, the Chemins de Fer de la Basse-Egypte, and the Fayum Light Railway. There is an increase of 20 miles, as compared with 1912, due to the completion of a new line from Salhib to Baltim, constructed by the Delta Light Railway Co. Capital value of railways, 1913, £E27,291,943; interest on cap-

ital, 5.97 per cent. Capital expenditure on State railways in 1913 amounted to £E446,000. For 1914, expenditure on capital works, £E443,000 were granted.

FINANCE. The alteration of the date of the financial year involved the preparation of an intercalary budget for the first quarter of 1914, which estimated for a surplus of £E155,000. All unused balances lapsed on March 13, 1914, with the inception of the new system. The budget for 1914-15 was estimated to balance at £E18,162,000. Revenue and expenditure for three years are shown in the table below:

	1911	1912	1913
Revenue ...	£E16,792,750	£E17,515,748	£E17,868,616
Expenditure	14,414,499	15,470,584	15,728,785

The total outstanding debt Jan. 1, 1914, amounted to £E94,202,540, and the annual charge for interest and sinking fund to £E3,551,266.

GOVERNMENT. The reigning Khedive at the date of the establishment of the British protectorate was Abbas (II) Hilmi. By associating himself with the Turkish military operations against Egypt he incurred the resentment of the British government and was superseded by his father's brother, Hussein Kemal Pasha, with the revived title Sultan of Egypt. The Sultan is a man over 60 years of age, experienced in administrative functions, and educated in the Paris of the Second Empire. Sir Arthur Henry McMahon was appointed high commissioner for Egypt.

HISTORY. The first Sultan of Egypt, Hussein Kemal, appointed in December, 1914 (see *YEAR BOOK, 1914, EGYPT*), chose the following ministers to form his first cabinet: Premier and minister of the interior, Hussein Rushdi Pasha; agriculture, Adli Yeghen Pasha; pious foundations, Ismail Sidki Pasha; public works, Ahmed Hilmi Pasha; finance, Yussuf Wahba Pasha; justice, Abdul Khalek Sarwat Pasha. Almost from the outset the newly created Sultan was confronted by foreign and domestic dangers. From without, Egypt was menaced by the ex-Khedive, Abbas Hilmi, who had been given the title "King of Syria and Arabia" by the Sultan of Turkey by way of consolation for the loss of Egypt, and was rumored to be engaged in mustering forces for an attack upon the usurping Hussein Kemal. More serious was the danger from the army which the Turks sent to attack the Suez Canal and invade Egypt. Thanks to the warships stationed in the canal and to the loyal British colonial troops encamped on the banks of the canal, all Turkish assaults were repulsed. (For details see article *WAR OF THE NATIONS, The Suez Canal*.) Within Egypt itself constant conspiracies were being formed against the Sultan's life. Sir Arthur McMahon, the new high commissioner, who arrived in Egypt Jan. 9, 1915, took prompt measures to insure domestic tranquillity; and care was taken to impress the populace with a sufficient display of British colonial troops; but in spite of all precautions, an attempt to assassinate the Sultan almost succeeded April 8. A few months later another attempt was made. A bomb was thrown at Hussein as he passed through the streets of Alexandria on his way to prayers, July 10. After this attack, the government

deemed it necessary to issue a proclamation ordering every person having knowledge of any plot to report it under pain of summary punishment by martial law; nevertheless in September a member of the cabinet was thrice stabbed by an employee of the ministry of finance. The regular November session of the Legislative Assembly and the elections which should have been held in January, 1916, were postponed by a decree of the government, October 27th. See also *ARCHÆOLOGY and WAR OF THE NATIONS*.

EHRLICH, PAUL. German scientist, died Aug. 20, 1915. He was born in Strehlen, in the Province of Silesia, in 1854, and attended school in Breslau, and later studied medicine in that city and at Strassburg, Freiburg, and Leipzig. His first studies were of the cellular elements of the blood, and his experiments in this work fortified him for his practical triumphs over certain blood diseases. About the same time he standardized his diphtheria antitoxin, which was adopted by the German government and which is used almost everywhere to-day. After the publication of this discovery, he took over the direction of a government institution founded at Steglitz, but its activities grew to such an extent that in 1899 the Royal Institute for Experimental Therapeutics was established at Frankfurt-on-the-Main, and Dr. Ehrlich was made its director. Here he carried on many experiments in the treatment of cancer, and in 1912 produced his cancer specific, nigrosin, which he had used on mice with great success. His most important discovery was salvarsan, widely known at first as "606" specific, for the cure of blood diseases. His experiments led him to the discovery of this remedy in 1910. Several years before his death he began experiments on the sleeping sickness. In 1906 Mrs. Georg Speyer endowed an institute for chemical therapeutics for Dr. Ehrlich. This was known as the Georg Speyer House. About the same time John D. Rockefeller learned of the contributions made by Dr. Ehrlich to medical science, and authorized the board of the Rockefeller Institute to place \$10,000 at his disposal. In 1904 he visited the United States, and delivered lectures in several large cities. He received the degree of LL.D. from the University of Chicago. In 1907 he delivered the Harben lectures in London, receiving the degree of Sc.D. from the University of Oxford. He was the greatest exponent of modern pathology. He with Dr. Metchnikoff was, in 1908, the recipient of the Nobel prize for research work in medicine. He was the author of many works on medical science.

ELECTION LAWS. See *ELECTORAL REFORM*.

ELECTION OF SENATORS, DIRECT. See *ELECTORAL REFORM*.

ELECTORAL REFORM. The State Legislatures in session in 1915 enacted many important measures relating to changes in electoral laws of the States. In several States changes were made in the residence qualifications of the voters. In Vermont the voter who changed his residence within 15 days prior to the election might vote in the town to which he moved. The Connecticut Legislature authorized a voter to retain, for the purpose of voting, residence in the town from which he moved. Meanwhile he was regarded as a resident of the town to which he moved, for the purpose of voting there at the following election. A similar provision was passed by the California Legislature. In Colorado, Michigan, Montana,

Washington, Wisconsin, and Iowa, qualified voters, absent from their resident precincts, were permitted to vote elsewhere in the State. In Texas a constitutional amendment was proposed authorizing absentee voting for State officers or on referendum.

REGULATIONS OF ELECTIONS. Separate ballots for judicial candidates in cities of 200,000 or over were required in Illinois and Wyoming. In these States judges had to be nominated regardless of political affiliation on judicial ballots at the general primaries. The Legislature of Indiana passed measures providing for the election by public vote of party committees of all kinds. It further provided that candidates for all offices, except State offices, and for presidential electors, should be chosen by direct primaries, but preferential voting for candidates for President, Vice-President, United States Senator, and Governor was authorized. Provision was made in West Virginia for nomination by direct primaries for all candidates for office, except specified judicial officers, presidential candidates and electors, and officers in small cities. The Legislature of South Dakota repealed the Richards Primary Law enacted in 1913, and restored the law of 1909, with amendments. New direct primary laws were enacted in California and Alabama. In Oregon provision was made for the election of delegates to national conventions, nomination of presidential electors, and for expression of choice of candidates for President and Vice-President. In Minnesota and Wisconsin a second-choice provision of the primary laws was abolished. In Vermont at the primary a provision for referendum was enacted. If the law is approved by the people, it will take effect in 1916; if rejected it will take effect in 1927. In Kansas provision was made for a system of individual declaration of intention to become a candidate as an alternative for nomination by votes. At the time of making this declaration the intended candidate must pay an entry fee of 1 per cent on his salary for the first year. The expenditure of any party for a single campaign is limited to \$15,000.

INITIATIVE, REFERENDUM, AND RECALL. The constitutional amendment authorizing the initiative and referendum was proposed in Minnesota and North Dakota. Frauds in connection with initiative, referendum, or recall petitions were penalized in California, and it was made a felony of 1 to 15 years' imprisonment to subscribe a fictitious name or the name of another person to such petitions. In Nevada provision was made for referendum on local and special legislation to the voters of the county affected. Improvement in the form of initiative bills is provided for in California, which requires the legislative council to cooperate in the passage of such measures on the request of 25 electors, and requires also the Attorney-General to prepare a title and summary for initiative improvements.

PROVISION FOR AMENDMENT OF STATE CONSTITUTIONS. A constitutional convention for the provision of an amendment in New York State was in session in New York (see NEW YORK). The question of calling conventions in Louisiana, New Hampshire, South Dakota, and Tennessee was submitted to the voters. If authorized the New Hampshire Convention will meet in 1918, and the Tennessee Convention in 1916.

ELECTRICAL ENGINEERING. See ELEC-

TRIC POWER, TRANSMISSION OF; ELECTRIC RAILWAYS; RAILWAYS; WIRELESS TELEGRAPHY AND TELEPHONY; etc.

ELECTRICAL INDUSTRIES. The European war continued to have its retarding effect on the development of electrical industries during the first part of 1915, but later on under improved business conditions there was a larger demand in most lines of activity, although not great enough noticeably to alter the financial results as compared with 1914. The accompanying table, compiled by a well-known authority in such matters, giving the gross earnings of the various electrical industries of the United States for 1915, shows a very slight increase—less than one-half of 1 per cent—in the result of operations as compared with the preceding year:

	1914	1915
Electric railways	\$ 780,000,000	\$ 700,000,000
Central stations	400,000,000	425,000,000
Telephone service	850,000,000	850,000,000
Telegraph service	85,000,000	100,000,000
Electrical mfg.	450,000,000	450,000,000
Isolated plants	125,000,000	125,000,000
Miscellaneous	125,000,000	125,000,000
Total	\$2,265,000,000	\$2,275,000,000

The exports of electrical machinery, appliances, instruments, etc., from the United States for the fiscal year ended June 30, 1915, amounted to \$19,771,757, a decrease of \$5,289,087, as compared with the corresponding period of 1914.

The iron and steel industry adopted electric power on an increasing scale and for a great variety of purposes. In steel works the arc furnace was apparently the most favored type, and there was a continually wider use of electricity for welding in railroad and automobile shops, etc. The adoption of electric japanning ovens for use in the automobile industry was making rapid strides and it was estimated that appliances of this sort having a total capacity of 12,000 k. w. were in use in or near the cities of Detroit and Toledo alone, besides an equal amount in widely distributed service stations of the various automobile manufacturing companies.

A project for the construction of a dam near Queenston, at the lower end of the Niagara Gorge, for developing 2,000,000 horse power of electrical energy, was under consideration during the year. A plant at this location, and of such large capacity, would increase enormously the development of the electro-chemical industries in and near the city of Niagara Falls. The importance of the matter alike to the industrial world and to all those interested in the preservation of the scenic beauties of the State of New York, was destined to lead to a bitter controversy.

At the close of the year it was the prevailing opinion that the competition of the jitney automobile that had made such serious inroads on the earnings of electric street railways had about reached its limit, and that owing to the growing recognition of the cost of supplying jitney service on a scale satisfactory to the public, the effect on the earnings of the traction companies would be less severe.

ELECTRIC BATTERIES. There was little change in the design of storage batteries during the year. A modified type of cell was brought out by Thomas A. Edison, Inc., of larger size and

stronger construction than the standard nickel-iron alkaline cell, and adapted for use in central stations and submarine boats. The positive elements consisted of layers of nickel hydrate and metallic nickel flakes packed in small perforated steel tubes. These were clamped into a grid called a subgrid, which was welded into a main grid frame of steel. The negative plates were oxide of iron and mercury packed in flat perforated pockets of nickel-plated steel. The chemical reactions are the same as those in the standard Edison cells in common use.

There was a marked increase in the application of storage batteries to vehicle propulsion not only for pleasure cars but for commercial trucks and fire apparatus as well. The growing recognition by the managers of electric central stations of the value of the electric vehicle as a by-product customer led in large cities to a better system for supplying energy for such purposes, as well as improved arrangements in garages to facilitate the charging, handling, and replacing of batteries.

An endurance test for a delivery wagon battery was made which established a new mileage record for such work, the vehicle traveling 98 miles with a single charge of its battery while operating under regular service conditions, over wet asphalt, carrying its regular load and making the average number of stops, of which there were 35. The amount of current consumed was about 165 ampere hours, or an average of 1.68 ampere hours per mile.

A number of electric locomotives for operation by storage batteries were built during the year, ranging in size from the smallest practicable type, for use in mines and having a height of only 41 inches, to a 10-ton locomotive built for use in the United States Navy Yard at Portsmouth, Va. This was equipped with two 21-horse-power motors, and its battery could develop enough energy to accomplish 800 ton-miles of travel on a level track.

ELECTRIC GENERATORS AND MOTORS.

See DYNAMO-ELECTRIC MACHINERY.

ELECTRICITY. See AGRICULTURE.

ELECTRIC LIGHT AND POWER. See MUNICIPAL OWNERSHIP.

ELECTRIC LIGHTING. The retarded progress of most industries during the earlier part of the year restricted the demand for electric lamps of all kinds, and conservative estimates reported that the total sales of incandescent lamps manufactured in the United States amounted to less than 100,000,000, about the same number as in 1914. Tungsten lamps made up 70 per cent of the total number sold. In 1914 about 1,000,000 gas-filled tungsten incandescent lamps were put on the market, while in 1915 it was reported that more than 1,750,000 lamps of this type were sold in the United States. This lamp was available in a variety of sizes rated from 200 to 1000 watts and adapted to voltages of from 220 to 250. There was an improvement in the efficiency of the 15- and 20-ampere lamps used for series street lighting, and the 1000-candle-power lamp used for this purpose showed a specific consumption of 0.45 watts per candle power. Its quality was further improved by an arrangement for avoiding the damage to the stem caused by the excessive heat of the gas.

Continued efforts were being made in large cities to improve the quality of street illumination. Some illuminating engineers preferred the

flame arc and magnetite arc lamps to the gas-filled tungsten unit, but this was not by any means universal and the substitution of the latter type for arc lamps in several large cities continued on an increasing scale, the prevailing type of the former being of 300 watts' capacity, with a limited number of the 400 watt size. The manufacturers were producing lamps capable of a useful life of about 2000 hours, a notable improvement over the former product.

The high and rapidly increasing cost of platinum during the year made it necessary for manufacturers to find a substitute for this metal to use for the leading-in wires of incandescent lamps. For this purpose an alloy of nickel and chromium was largely employed, and to a limited extent metallic tungsten and molybdenum were used.

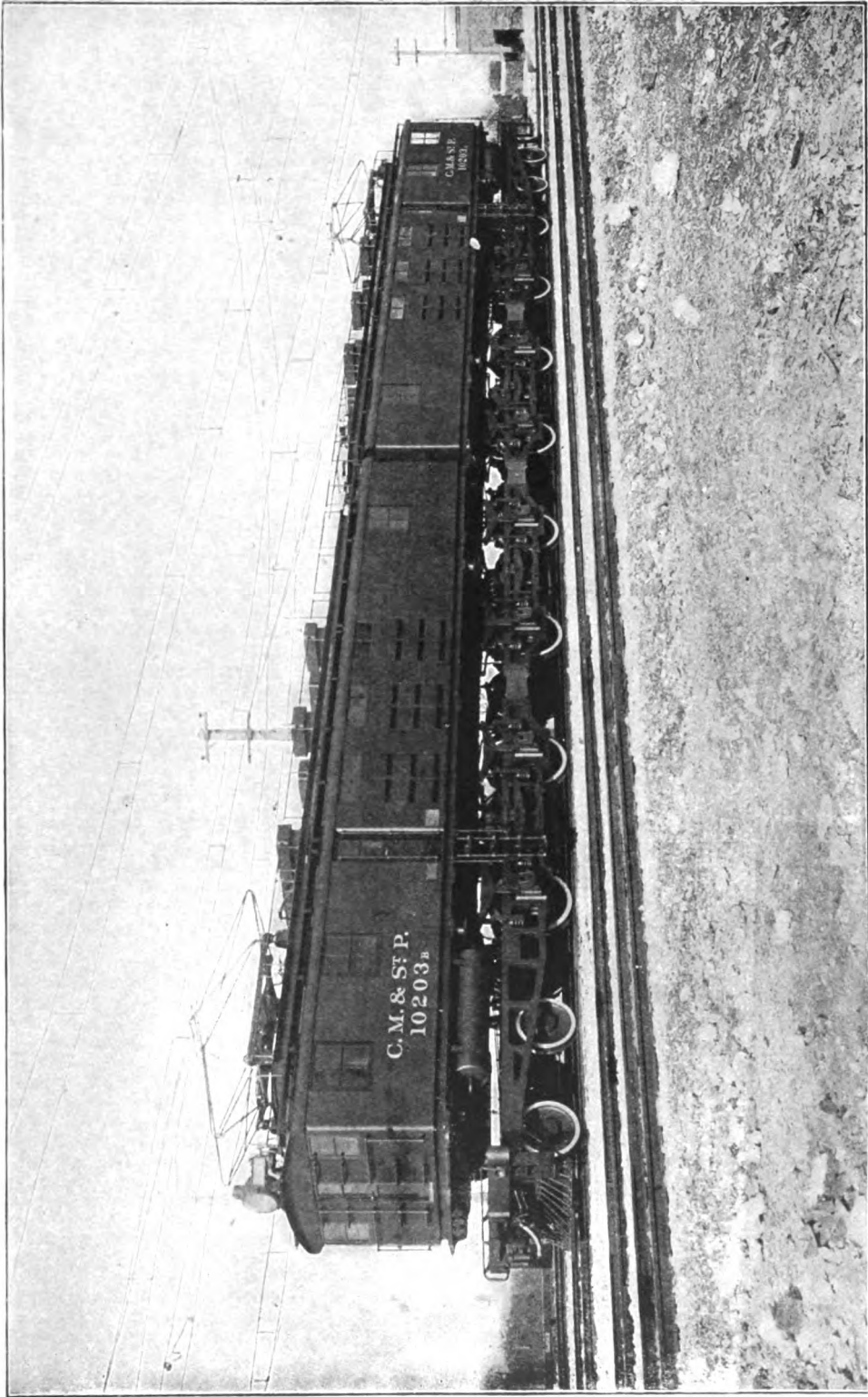
In England a novel type of tungsten arc lamp was being developed. The lamp was filled with nitrogen at a pressure of about two-thirds of one atmosphere, and the filament was of tungsten combined with the refractory oxides zirconia, thoria, and yttria. In operation the heating of the filament ionized the gas between it and another electrode, thus leading to the formation of an arc after a few moments. The lamp was so made that the arc occurred between small globules of tungsten, and while still in an experimental stage at the close of the year, gave promise of furnishing a highly efficient light. Its ordinary efficiency was 0.5 watt per candle power, and the color of the light a bright yellow. Higher efficiencies than this were obtained and the color of the light became a dazzling white, but the arc under those circumstances was not as stable as could be desired.

A portable searchlight for fire department use was developed that was giving highly satisfactory results in service. The light was furnished by a 35 volt, 750 watt Mazda lamp of the focus type, for which current was furnished by a 35 volt Edison storage battery of 150 ampere hours' capacity. The focusing device attached to the lamp made it possible either to concentrate the light in a parallel beam of almost 1,000,000 candle power for penetrating dense smoke, or for furnishing a divergent beam to illuminate a wide area such as the entire front of a high building. The apparatus, which weighed only 600 pounds, was mounted on two wheels and could be operated by one man.

The Illuminating Engineering Society, of which Dr. Charles Proteus Steinmetz was elected president in 1915, continued its active work during the year in stimulating and educating the public taste for better quality of illumination, especially as regards its influence on the human eye. The society published in September, 1915, a Code of Lighting for factories, mills, and other work places, embodying a systematic effort to diffuse reliable information on this highly important subject. One of the large accident insurance companies reported as the result of an extended investigation that 25 per cent of all the industrial accidents could be traced in one way or another to improper lighting.

ELECTRIC POWER, TRANSMISSION OF. In the transmission of electric power there was no particularly notable work done in 1915. Existing transmission lines were extended as the demand for energy increased and became diversified. The maximum voltage, 150,000, that had been employed on several such lines in 1914, was not

ELECTRIC LOCOMOTIVES



LOCOMOTIVE FOR CHICAGO, MILWAUKEE AND ST. PAUL RAILWAY

The first electrification for through traffic on a trunk line. Designed and built by General Electric Co. Operates at 3,000 volts direct current

exceeded. Experience with the steel towers commonly used disclosed the fact that in several instances they were unable to resist the twisting action set up by high winds when heavily coated with ice and sleet, thus causing destruction of property and interruption of service.

The Great Falls Power Company of Montana completed a plant of 60,000 horse power capacity on the Missouri River at the site from which the company derives its name. Late in the year this plant began to supply electric energy at 100,000 volts, over a line 140 miles long, to the Chicago, Milwaukee & St. Paul Railway for the electric locomotives on that portion of its line (about 230 miles in length) between Deer Lodge and Harlowton, that had been equipped for such operation. (See **ELECTRIC RAILWAYS.**)

An interesting hydro-electric plant was put in operation during the year in Japan, noteworthy for the large amount of power developed and because it distributed energy at the highest tension of any transmission line in the world outside of the United States and Canada. This plant utilized the power of the Nippashi River, the outlet of Lake Inawashiro. Sixty thousand horse power developed at this location by a fall of 350 feet was being transmitted over two three-phase circuits at 115,000 volts, a distance of 145 miles to the city of Tokyo. The apparatus was supplied by manufacturers in England, Germany, and the United States. In Toledo, Ohio, an underground cable adapted to the unusually high voltage of 23,000 was put in use during the year. Hitherto, the maximum voltage for underground cables had been 13,200. The municipality of Treves, Prussia, was distributing electric energy throughout the city by underground cable at 25,000 volts, a more notable achievement even than that just mentioned. Before this cable was put in use it was tested for a half hour at 75,000 volts with three-phase alternating current and showed only 250 watts per kilometer dielectric loss.

ELECTRIC RAILWAYS. Several important developments in the application of electric motive power to railways marked the year 1915. At the beginning of the year more than 2250 miles of steam railway tracks in the United States had been converted to electrical operation, using either third-rail or overhead conductor. In addition to motor cars in use on those lines there were more than 280 electric locomotives in regular service. During December the Chicago, Milwaukee, and St. Paul Railway was making tests of new electric locomotives built for its 440 mile electrification in Montana and Idaho. These locomotives were the largest and most powerful electric engines ever built, weighing 282 tons, and were for operation at the highest voltage (3000) ever attempted with direct current. As shown in the illustration, they were of the double unit type, each half having the 4-4-4 wheel arrangement consisting of a four-wheel guiding truck and two four-wheel motor trucks with a 375-horse-power motor geared to each axle, giving a total rating of 3000 horse power for the double unit. Their one hour rating was 3440 horse power, giving a tractive effort of 85,000 pounds, while for starting, almost 135,000 pounds could be depended on. On a test run two of these locomotives hauled a train of 48 loaded cars, weighing 3000 tons, up a 2 per cent grade at a speed of 16 miles an hour. This train was followed up the grade by another com-

posed of 37 cars weighing 2000 tons, and pulled by two standard steam locomotives assisted by a Mallet engine as a pusher. This train went up the grade referred to at a speed of 9 miles an hour. The St. Paul engines were also notable for being the first direct-current locomotives ever built to use "regenerative" control, an arrangement for so connecting the motors when descending grades as to act as generators and return current to the line, thus retarding the train.

Early in the year the Norfolk and Western Railway began the operation of a 30-mile stretch of its line in West Virginia with electric locomotives, illustrated in the 1914 YEAB BOOK. These machines operated with alternating current from an overhead conductor at 11,000 volts, and were hauling in regular service trains having a total weight of 3250 tons. One of the important features of the polyphase motors used on these locomotives was their equipment also for regenerative braking but differing from that above mentioned on account of the use of alternating current. Another important electrification was that inaugurated by the Pennsylvania Railroad in September, between Broad Street Station, Philadelphia, and Paoli, Pa., about 20 miles distant. No electric locomotives were used, but 93 motor passenger coaches were employed, equipped with series-repulsion motors of 450 horse power, taking energy from an overhead conductor at 11,000 volts alternating current. This installation, in the opinion of the railway officials, increased the total capacity of Broad Street Station by more than 8 per cent, and the company was contemplating equipping the 12-mile Chestnut Hill branch in the same manner during 1916.

In England, the London and South Western Railway began the electrification of nearly 50 miles of suburban lines near London, using 600-volt direct current with a third rail.

The Swedish State Railways began electric operation of their line from Kiruna to Rikagårsen in October. This attracted considerable attention because it was the first Swedish line to use electricity, and because of its northerly location, which for part of its length was within the Arctic Circle.

ELECTRIC SHIP PROPULSION. See **DYNAMO-ELECTRIC MACHINERY.**

ELECTRIFICATION OF RAILWAYS. See **ELECTRIC RAILWAYS; RAILWAYS.**

ELECTRIFICATION OF RAILWAYS AT CHICAGO. See **SMOKE ABATEMENT.**

ELECTRO-METALLURGY. See **METALLURGY.**

ELEVATORS. A notable work of the year in this field was the completion of a 5,000,000-bushel bulk grain elevator by the municipality of Seattle, Wash. It was built and owned by the city, by which it will be operated. It was designed to afford storage for the local flour mills, and to facilitate commerce, and especially the interchange between rail and ship transportation of the product of the grain fields of Montana, Idaho, and Washington. The new elevator was of concrete, 165 feet high, with a receiving capacity of 95 cars per each 24-hour day, and a shipping capacity of 20,000 bushels per hour. All equipment is electrically operated and access is given to tracks from four railroads, the structure standing between the dock and the tracks. The total cost was \$281,862.

A new method of controlling the elevators or lifts on the London Underground Railway was inaugurated this year. The attendants were stationed at the top and bottom landings instead of inside the cars, on the theory that a man was always available to deal with the inquiries of passengers, and could control the loading of the cars better from the outside than from within. The method consisted of installing control boxes at the various landings which not only served to control the movements of the cars themselves but also to open and close the gates and doors by the action of compressed air. These control boxes were arranged for the electrical control both of the operating gear of the elevators, and the air for the doors and gates. Fifty-one elevators were to be equipped for operation in this manner, and the Central London Railway was also to have the new arrangement installed on the elevators of older pattern.

ELKIN, JOHN PRATT. American jurist, died Oct. 3, 1915. He was born in Indiana Co., Pa., in 1860, and graduated from the Law School of the University of Michigan in 1884. He was admitted to the bar, and began active practice. In 1885 and in 1887 he served in the Pennsylvania House of Representatives; from 1895 to 1899 was Deputy Attorney-General of the State; and in the latter year he was elected Attorney-General. He was Republican candidate for Governor in 1902, and in 1905 was appointed to the Supreme bench of the State. He was at one time chairman of the Republican State Committee, and was a delegate to many Republican National and State conventions.

EMERSON, LUTHER ORLANDO. American composer and hymn writer, died Sept. 29, 1915. He was born in Parsonfield, Me., in 1820, and received an academic education. Studying music, he became teacher and choir master at Salem, Mass., and was afterwards organist and director in the Bulfinch Place Church in Boston. He directed about 300 musical festivals and conventions, and made over 70 selections of church and other music. He also compiled many other books for piano and organ, and composed largely. He composed the music for the song, "We Are Coming, Father Abraham," popular in the days of the Civil War.

EMETIN. See PYORRHCEA ALVEOLARIS.

EMIGRATION. See IMMIGRATION AND EMIGRATION.

EMPLOYERS' ASSOCIATIONS. The first important association of employers in the United States was the Stove Founders' National Defense Association, formed in 1886. It was followed by numerous others before the close of the century. Most of these were formed along trade lines and had for their main purpose the meeting of trade union demands, though they also sought to advance the general interests of the trade. There followed more powerful organizations, including employers as such, regardless of industrial lines. These sprang up in various cities and States under such names as "Citizens' Alliance," "Citizens' Industrial Association," "Employers' Association," and "Manufacturers' Association." The most important of these is the National Association of Manufacturers described below. In 1913 the investigating commission of Congress, created to inquire into such associations on the score of the scandals connecting members of Congress with the legislative activities of the National Association of Manufacturers, secured a

list of more than 200 associations of employers. Such organizations are an inevitable accompaniment of modern industrial conditions and hence are found in England, France, and Germany. Everywhere their purposes are the same. They seek to advance the legislative interests of employers, to secure the advantages of coöperation and combination, and especially to oppose the political and industrial activities of organized labor. Thus they have in all these countries made use of lockouts, black lists, employment bureaus with registers of workmen, professional strike breakers, strike funds, "fake" unions, detective agencies, armed guards, and spies. On the other hand, there has been an increasing tendency on the part of employers to recognize unions, to enter into collective agreements, and to provide suitable machinery for the settlement of grievances and trade disputes. Only a few notable associations can be described here.

THE NATIONAL ASSOCIATION OF MANUFACTURERS began in 1895 as a voluntary association, but 10 years later was chartered as a membership corporation under the laws of New York. Its membership includes individuals, partnerships, and corporations in all kinds of manufacturing businesses. In 1915 it had about 4000 members with combined capital of \$10,000,000,000 and employing about 5,000,000 workers. It thus claimed to be "the largest and strongest trade organization in the world, whether one considers capital invested, hands employed, or output." It has a foreign trade department for studying opportunities in international commerce; a legal department for supplying advice to members on State and corporation law; and a foreign and domestic collection department. It has also a Committee on Industrial Betterment for studying plans for improving the conditions of labor. During the summer of 1915 this committee made a report on the minimum wage at home and abroad. In the view of the committee the weight of the argument was against the advisability of establishing a legal minimum wage. It held that "the general operation of the legislative minimum wage has everywhere been unsatisfactory to employers and employees." Competent students, in commenting on this report, universally condemned it as warped in spirit and as setting forth general opinions unsupported by facts. The annual membership dues of the association are \$50. As it can conduct no business ventures, it has formed an auxiliary corporation, the National Manufacturers' Company, which publishes two export journals and the official magazine, *American Industries*. Its headquarters are at 30 Church Street, New York City.

THE NATIONAL COUNCIL FOR INDUSTRIAL DEFENSE was formed in 1907 through the initiative of President Van Cleave of the National Association of Manufacturers. The primary object was to focus the power of numerous associated employers in opposing legislation deemed "unwise," "vicious class legislation," and to promote legislation deemed "wise." The Council virtually consists of a chairman, treasurer, and counsel, these being, respectively, two chief officers of the N. A. M., and Mr. James A. Emery as counsel. The constituent organizations contribute as they see fit to the necessary expenses, there being no fixed membership fee, but each grants the counsel full power of attorney to represent them in State and national legislative contests.

THE AMERICAN ANTI-BOYCOTT ASSOCIATION

likewise owes its existence to the National Association of Manufacturers. It was formed to fight organized labor in the courts, and especially to put an end to the use of the boycott. It had a prominent part in two famous cases, the Buck's Stove and Range Company case, and the Danbury Hatters' case. See *BOYCOTT*.

THE NATIONAL METAL TRADES ASSOCIATION includes numerous powerful employers in all branches of the metal industries and machine trades. It has branches in some 15 or 16 cities where these trades are important, each branch exercising considerable local autonomy. It has been a most determined opponent of any "dictatorial" action by organized labor, and especially of the closed shop; and while it is not as a whole opposed to the union shop with collective bargaining, some of its stronger branches have successfully opposed every form of recognition of organized workers. It holds the following principles as essential to the conduct of the business of its members and hence cannot be made subjects of arbitration: the number of apprentices, helpers, and handy men must be determined by employers; wages must be fixed by employers; any employee may leave when he sees fit, or the employer at his discretion may discharge any employee. This association has made a most effective use of registers of workers by means of the employment offices maintained in connection with local branches. The records of employees of all member concerns are kept; men cannot transfer from one firm to another without a suitable card from this employment office; the same is true to a large extent of men from other cities who have previously worked in the metal trades. The national headquarters are in the People's Gas Building, Chicago, Ill.

COMMISSION ON INDUSTRIAL RELATIONS. The preliminary report of this Commission (q.v.) included a statement of 21 criticisms of employers' associations. Most of these had been advanced by trade unionists, who favored the formation of such associations as essential to effective collective agreements, but who objected to various methods and policies of many associations. It was objected that they frequently oppose the organization of the workers; to this employers replied that they do not object to unions formed on proper lines, but that they do object to unions which interfere with the employer's right to conduct his business in his own manner and with the right of the worker to determine what conditions of employment he individually is willing to accept. It was objected that the salaried secretaries or managers of employers' associations are usually not employers, lack contact with industry, and to keep their jobs stir up enmity; this was declared by employers to be in the main untrue. To the charge that the associations are usually dominated by small cliques, it was replied that this was simply such centralization of power as experience had shown to be effective. The charge that the associations were indifferent to the condition of workmen was generally admitted on the ground that the associations were formed for purely business reasons and left individual employers free to do what each saw fit in the way of welfare work. The charge that office records of workmen were used to blacklist agitators and unionists was admitted, but it was contended that men ought to be employed on the basis of their past records, and that the elimination of the agitator was in the interest of in-

dustrial peace. That associations opposed to trade unions have boycotted employers using union labor and goods bearing union labels was answered by the contention that such action was taken as defense against union aggression. It was charged that associations, by employing armed guards, maintain a state of feudalism, and oppose the constituted authorities of the State, while these guards themselves provoke violence; to this employers answered that the employment of guards was due to a failure of the government to perform its duties, that, since this involved heavy expense, it was a result, not a cause, of violence, and that since violence was most detrimental to employers' property and faithful workers, it is inconceivable that employers would encourage violence. To the objection that the associations maintain spies and detectives to spy on unions, harass union officials, and foment strikes, it was replied that detectives were used to secure only such information as the employers need, and that it is not probable that employers stir up trouble among their workers only to suffer the consequent losses.

That employers' associations maintain bodies of strikebreakers, who are not bona fide workmen but only mercenaries in the industrial war was defended on the ground that plants must be kept in operation and that the maintenance of a supply of reserves is only an example of business foresight. To the charge that the associations defend members in case of strikes without determining the justice of the issues, the employers replied that this was not frequent and that behind an apparently just strike may be fundamental principles which the employers must maintain. The employers contended that no association exercised such control over its members as to compel them to so distribute advertising that the press could be brought under control. They also contended that the influence of employers over judges through social contact was not greater than the influence of labor through elections of judges. To the charge that the agents of associations bribe union officials, it was answered that such bribes were usually solicited and that no association would be warranted in disciplining a member "held up" by a trade union official. The employers admitted that the associations maintain lobbyists at State and National capitals, but this involved great expense and would not be done had experience not shown it to be a necessary protection against foolish and burdensome legislation. Other minor objections were made and similarly answered.

In its *Final Report*, the Commission included a section on "Organization, Methods, and Policies of Employers' Associations." It found that such bodies had increased rapidly in number and power during the past 10 years, and that they were of two classes, "bargaining" associations, formed to make collective agreements, and "hostile associations," formed to oppose trade unions and collective bargaining. Of the latter a fundamental principle is that wages shall be determined solely by the individual employer and individual worker. Such associations see to it that the number of union men in the shops of members is kept within suitable limits; they nearly all maintain employment agencies and secret-service departments. The report, which was written by Basil M. Manly,

condemned the "hostile" associations as anti-social and recommended the formation of strong associations for the determination in a democratic and equitable manner through collective agreements of the conditions of labor.

EMPLOYER'S LIABILITY. See **WORKMEN'S COMPENSATION.**

ENDANGER. See **PYORRHOEA ALVEOLARIS.**
ENGINEERING. The year 1915 was somewhat abnormal in practically all branches of engineering, when the world at large is considered. The attention of engineers in the leading European countries was turned to the great war and military engineering was paramount to all other considerations. The services of all departments of engineering were enlisted by the great armies, and never before had warfare involved such destructive means and such scientific methods. Not only were these concerned with the actual combat, as discussed under **MILITARY PROGRESS** and **NAVAL PROGRESS**, but also with the supply of the various munitions, including ordnance supplies to battleships, improved shoes, metal helmets, clothing, and other articles manufactured specially. These scientific methods applied also to the operation of railways and waterways under purely military conditions or under conditions changed by military necessities. In the neutral or non-belligerent countries the manufacture of war munitions enlisted the attention of many large manufacturers, and in the United States particularly, new plants came into being for the manufacture of explosives, shrapnel, motor vehicles, aeroplanes, and other munitions of war, where the latest methods of machine operation and factory organization were applied.

As is usual in the **YEAR BOOK**, the more important branches of engineering will be found discussed under their individual heads. See, for instance, in civil engineering, the following articles: **AQUEDUCT**; **BRIDGES**; **BUILDING OPERATIONS**; **CANALS**; **DAMS**; **FLOOD PREVENTION**; **RAILWAYS**; **TUNNELS**; **WATER PURIFICATION**; and **WATER WORKS**. The **PANAMA CANAL**, with its record of successful operation for a few months, till the great slides caused its closure, is also discussed in a separate article, while the much needed harbor improvement at various American ports is considered under **DOCKS AND HARBORS**. The article on **RAILWAYS** in 1915 is particularly interesting, in view of the depression under which the great transportation companies had been operating for several years, and of the improvement of the railway business with a renewal of prosperity. **MUNICIPAL GOVERNMENT**, as usual, requires careful consideration, and this it receives from the **YEAR BOOK**, with a discussion of such problems as **WATER SUPPLY**, mentioned above, **GARBAGE AND REFUSE DISPOSAL**, and forms of municipal engineering and activity, such as **FIRE PROTECTION**, where improved methods of engineering not confined merely to apparatus but extended to proper construction and inspection, were made evident.

In **Electrical Engineering** the year 1915 saw the first long distance electrification of a trunk line—the Chicago, Milwaukee, and St. Paul, in its Rocky Mountain section, through Montana and Idaho. This involved special equipment and locomotives, which are discussed under **ELECTRIC RAILWAYS**. In **DYNAMO-ELECTRIC MACHINERY** the most notable progress of the year was not, as hitherto, an increase in the

size of the various units put under construction or completed, but the large number of units of unusual size and capacity which seemed to be considered the best practice. In **Communication** the most notable advance was in wireless telephony, where successful conversation was maintained between Washington and Honolulu, and signals from San Francisco were heard at Paris. This is discussed under **WIRELESS TELEGRAPHY AND TELEPHONY**. Under **TELEPHONY** the completion of successful transcontinental communication by wire on a commercial basis was the notable event of the year.

In **Mechanical Engineering** the depression that was felt until well into the year acted against any extensive developments, though some progress was to be noted in **INTERNAL COMBUSTION ENGINES**, and larger **BOILERS** with higher steam pressures and higher superheat were considered the coming practice. Under **AERONAUTICS** great developments in size, power, and strength of aeroplanes, as demanded by war conditions, were the order of the year, and great triplanes spreading a hundred feet were reported at its close.

The record of the **SUBMARINES**, while not particularly creditable on the moral side, from the engineering point of view indicated progress, as the increased radius of activity of these vessels indicated good construction and design.

In **SHIPBUILDING** the renaissance of construction in the United States due to war conditions was not accompanied by any original or novel features of design, but naval engineers were interested in the performance of the warships of belligerent navies, and the new battleships that were being designed, built, and placed in service.

In short, the year's record as outlined under the topics given above, and under similar titles, is one that must be considered in the light of the war, and not as marking any great development in theoretical engineering or actual design and construction.

ENGINEERING CONGRESS. See **INTERNATIONAL ENGINEERING CONGRESS.**

ENGLAND. See **GREAT BRITAIN.**

ENGLAND, CHURCH OF. During 1915 all church questions were necessarily considered in their relation to the great war. The work of the army chaplains was efficient, but their number was too small. Dr. L. H. Gwynne, Bishop Suffragan of the Sudan, was put in general charge of army work. Dr. A. F. Winnington-Ingram, Bishop of London, was actively engaged in ministrations in France and Belgium, and paid many visits to the soldiers in the trenches.

The three outstanding features of interest during the year were: Welsh Disestablishment; the opinion of the Central Consultative Body of the Church of England on the Kikuyu Conference; and the question of revision of the Prayer Book.

With regard to the first, it was found that the Welsh disestablishing law, strictly construed, permitted its being put into force immediately in certain parts of Wales, though not intended to be generally operative until the close of the war.

With regard to the Kikuyu Conference, the action of the bishops, and also the scheme of federation there proposed, were referred by the Archbishop of Canterbury to the Central Consultative Body of the Church of England, which published in 1915 the following opinion: "The Central Consultative Body heartily appreciate

the fact that the main object of the Kikuyu Conference—namely, the promotion of a brotherly spirit and the adoption of practical steps toward unity—is wholly desirable. All this, with the mutual consideration involved, and with the united testimony borne to the faith which is enshrined in the Apostles' and Nicene Creeds, plainly makes for unity; and it is by such methods and by such a temper, more, perhaps, than by formal organization, that the conditions may be realized in which the end of our efforts and our prayers—a genuine African Church—will be shaped by the Holy Spirit of God according to His will." This opinion was endorsed by the Archbishop, who, nevertheless, emphasized the difficulty and danger of allowing one section of a great communion to federate itself with some of those outside of it. He admitted that interdenominational preaching might be allowed, if care were taken not to contravene the authority of the diocesan bishop. He also favored a large discretion for the diocesan bishop in regard to admitting unconfirmed persons to the Holy Communion. With regard to the special eucharistic service held at Kikuyu, at which such persons were admitted, the Archbishop advised abstention at present from such services.

A joint committee of the two houses of the Canterbury Convocation recommended a number of changes in the Prayer Book. These include a rearrangement of the Psalter, a revision of the calendar, and alterations in the ornaments rubric, the daily offices, and the litany.

In 1915 there were in England and Wales approximately 2,446,000 Anglican communicants and 2,541,000 Sunday school scholars. There were 14,019 beneficed clergymen, 222,309 Sunday school teachers, and about 7700 assistant curates. The annual income from voluntary offerings is between £12,000,000 and £14,000,000.

ENTOMOLOGY. As has been stated in earlier YEAR BOOKS, economic entomology is a subject of especial interest in the United States where insect pests (other than those carrying disease) are undoubtedly of more pressing importance than anywhere else. A large number of these pests are imported, but some are undoubtedly indigenous. Writing from an ecological standpoint, Shelford considered the latter condition an indirect result of the removal of forests. He thought that the original habitat of these insects was in "cracks" in the original forest; i.e. along the margins of streams and ponds, and on rocky highlands where trees do not grow. As the forests were removed, the insects spread from these "cracks" over larger areas.

The gypsy moth has continued to spread over New England, accompanied in many cases by the brown tail. Twenty towns in Connecticut report the presence of the gypsy, and 72 the brown tail. In this State the last Legislature appropriated \$25,000 to be expended in the next two years in combating these insects. The gypsy moth problem is discussed in *Bulletins* of the United States Department of Agriculture, the general conclusion being that in many cases we must resort to reforestation with trees on which the animal does not feed, if we are to have any forests left. For apples, spraying with arsenate of lead and thorough removal of all probable nesting places in the immediate neighborhood are recommended. In Europe, Burgess reported that coniferous trees are not attacked, but that

other trees are subject to periodical attacks. In Massachusetts, a number of parasites have become acclimated; two of these are hymenopterous parasites, and one is a fly, while the Colosoma beetle is doing effective work in feeding on caterpillars of both the gypsy and brown tails. Egg clusters have been found on quarry products, and in October, 1914, a quarantine was declared against these, similar to the one earlier placed against lumber products. Quarry products must now be inspected exactly as are the others.

Much work was done during the year on the house fly problem. Experiments conducted in Texas indicated that in order to prevent reproduction it is necessary to capture the female flies within 4 days after they emerge in summer, and within 10 days in early fall and spring. The egg stage lasts less than 24 hours even in winter, while the larval stage varies from 3½ days to about 3 weeks. While horse manure is their favorite breeding material, they will breed in almost any decaying materials such as ensilage, bottoms of burned straw stacks, etc. Flies will feed on manure, but in these experiments, did not lay eggs when this was the only food. These experiments in Texas indicated that the fly, with plenty of food, will live to an age of 53 days, but no evidence was seen that they can hibernate as adults. It seemed demonstrated that hibernation is always as eggs or pupæ. Hewitt, however, in other localities, thought he found them hibernating in the adult condition.

According to a *Bulletin* of the United States Department of Agriculture, the compound *Para-dichlorobenzole*, used in the proportion of 1 pound to every 100 cubic feet of space, is superior to carbon bisulfid in killing insects. It is not injurious to human beings unless taken internally.

That the public is becoming aware of the seriousness of the fly problem is evidenced by the number of publications that appeared during the year, both from the government printing office, and from private sources. The best mode of prevention is undoubtedly to eliminate breeding places, but this is not always practicable, and attempts have been made to discover some effective larvicide. A publication of the United States Department of Agriculture recommended the use of hellebore, ½ pound dissolved in 10 gallons of water for each 8 bushels of horse manure, as an efficient larvicide, and one that does not affect the value of the manure. For outhouses, etc., they recommended the use of powdered borax in the proportion of 62 pounds to 8 bushels of manure. If used in larger quantity, the borax is liable to injure the material for fertilizing purposes, by killing vegetation with which it comes in contact.

Since 1912 the mosquito work in the State of New Jersey has cost \$200,000, while the property values within the protected area have increased more than \$5,500,000.

Unusually successful results from the importation of parasites of injurious insects are reported from Hawaii, where, according to Howard, more has been done along this line than anywhere else in the world.

Much trouble was experienced in California from the insects which infest dried fruit. Of these the "Indian Meal" moth, the fig moth, and a number of beetles are most important. It was estimated that a single "Indian Meal" moth

will give rise to 23,000 larvæ in the course of a summer. Infestation may take place at any stage of the preparation of the fruit, though heating and the sulphur treatment which are used in the "processing" tend to kill the insects. The fruit may also become infested after it is packed, and hence it is desirable that some method of sealing the packing boxes should be devised.

In the *Australian Zoölogist* is recorded the appearance in Australia of a carpet beetle (*Attagenus piceus*) imported in cloth from London, and a West Indian longicorn beetle (*Eburia binodosa*) was seen to work its way out of an imported oak chair. The observations were interesting as showing possible means of transportation of insects. It was feared that the carpet beetle might develop into a serious pest.

An alarming discovery recently made in Arizona is that there is a variety of the cotton boll weevil feeding on cotton-like plants. In Texas some parts of the State have been free from the weevil because of the dry climate. If this newly discovered form can live in the dry climate of Arizona there is reason to fear that it may spread to Texas and attack the cultivated cotton there. It is now found only on the wild plant, but might change its food habit at any time. See also INSECTS, PROPAGATION OF DISEASE BY.

EPILEPSY. Reed returns to the old theory that epilepsy is due to a toxic state of the system, originating in the intestinal canal, either as a result of chemical changes in the food after ingestion, or in consequence of bacterial fermentation, or both. Looking for the causes of this intestinal toxemia, he found that obstinate constipation was a common phenomenon in epilepsy, and this was of a mechanical nature, due to displacements, malformations, adhesions, angulations, etc., of the intestines. The whole question resolves itself into providing adequate intestinal drainage and his surgical experiences have confirmed these theories to a remarkable extent. Besides correcting malpositions, releasing adhesive bands, and the like, Reed's main procedures have been colectomy and short-circuiting the large bowel, the same procedures that are used by Sir Arbuthnot Lane and his followers for the cure of intestinal stasis. Reed reported that in his cases constipation was promptly overcome and as a rule the epileptic seizures disappeared immediately. In other cases, attacks of the *grand mal* type assumed the light character of *petit mal*. The question naturally arises, why do not other individuals with precisely the same pathological lesions as those which he found in epileptics suffer from epilepsy? Reed answers by asserting his belief that the infection is specific and probably due to a gas-forming bacillus. He was unable to find any case of so-called traumatic epilepsy, assigned to some injury of the head; on the contrary, he found where a history of traumatism existed, the injury manifested itself in the intestine; that is, there was evidence in the way of prolapse of this structure or of other abdominal organs.

EPISCOPAL CHURCH. See PROTESTANT EPISCOPAL CHURCH.

EPWORTH LEAGUE. See articles on Methodist denominations.

ERIE FLOOD. See FLOOD PREVENTION.

ERITREA. An Italian colony on the west shore of the Red Sea. Estimated area, 45,800 square miles; population, 279,000. Asmara is

the capital. Salt is an important product, being sent to Southern Abyssinia, where it is a monetary currency. Imports, 1912, 18,845,118 lire; 1910, 16,372,830 lire; 1909, 17,225,720. Exports, 1912, 9,371,802 lire; 1910, 7,277,865; 1909, 6,845,026; transit, 1912, 5,234,262; 1910, 3,857,351; 1909, 3,152,380. Tonnage entered, 1912, 178,152; 1911, 191,101; 1910, 164,696. There are 74 miles of railway. The railway from Massaua to Asmara was finished in 1911; it will be extended to Keren and Agordat. Estimated revenue (1910-11), 8,977,750 lire (state contribution, 6,350,000); expenditure, 7,223,700 (military administration, 3,988,200). The 1912-13 budget balanced at 13,008,004 lire. Local revenue (1913-14) was estimated at 3,221,000 lire.

ESPERANTO. See INTERNATIONAL LANGUAGE.

ESSAYS. See LITERATURE, ENGLISH AND AMERICAN.

ETHICS. See PHILOSOPHY.

ETHIOPIA. See ABYSSINIA.

ETHNOGRAPHY. See ANTHROPOLOGY.

ETHNOLOGY. See ANTHROPOLOGY; and PEABODY MUSEUM, *passim*.

EUGENICS. Not the least of the effects of the great war has been the interest aroused by it in the question whether, because of the conflict, the human race is or is not deteriorating in those qualities which are handed down from generation to generation, not by means of training but by inheritance. During the early part of 1915 the English people were much disturbed by the so-called problem of "war babies." Not only was moral deterioration feared from an anticipated increase in illegitimate births, but the question was also raised whether the coming generation would not be disadvantageously affected. The problem early assumed large proportions in the press, but evidence later collected showed that matters were greatly exaggerated. Attention then turned to the more serious question as to whether the sudden removal of a large proportion of potential fathers from their homes—a British army of 3,000,000, for example, requiring every second man between the ages of 18 and 45—would not greatly affect the eugenic qualities of the future population by leaving only the more inferior parents to contribute to it. Among many articles on this subject, those of Prof. J. A. Thomson on "Eugenics and the War" (the second Galton Lecture) in *The Eugenics Review*, April, 1915, and of Prof. Roswell H. Johnson, on "Natural Selection in War," in *The Journal of Heredity*, December, 1915, were perhaps the most valuable because of the scientific caution displayed. Both of these writers agreed that the effect of the war would be "dysgenic." In this connection, a recent book by Profs. D. S. and H. G. Jordan, on *War's Aftermath* (Boston, 1914), is interesting. This book is an attempt to gauge the eugenic effects of the Civil War.

During the past year, both in the scientific and in the practical phases of eugenics, many noteworthy advances have been made along usual lines of inquiry. On the scientific side, for example, the Italian Anthropological Society was reported to be making an investigation, on a scale which was expected to definitely settle the question, as to whether first-born children, as has been maintained by the English Biometric school, are usually inferior to others. Much discussion has occurred also concerning pro-

posed modifications of the famous "Binet Test" for mental ability. The practical application of the Binet scale itself has been extending rapidly in public-school systems, in institutions for the feeble-minded, in prisons, and in other institutions. Striking results of its application have sometimes been reached. H. B. Hickman reported, for example, in the *Training School Bulletin*, January, 1915 (vol. xi, No. 9), that out of 229 delinquent and criminal boys tested, only about 63 would be able to leave the institution and take a normal station in society; at least 45 would be unfit for anything but institutional life; and the remainder would always require assistance of some kind to make a living. The same report contained an account of "The First Psychopathic Laboratory in a Prison" (Kansas), by Alexander Johnson. According to Mr. Johnson, during the year ending Aug. 17, 1914, 325 men were examined; 224 white, 101 colored. Of the whites, 33, or about 15 per cent, were found to be normal mentally; of the negroes, about 4 per cent. Seventy-five per cent of the whites and 90 per cent of the negroes were classed as "morons."

While, on the one hand, work of a character which is likely in the end to produce scientific results has thus been accomplished, on the other hand, a considerable amount of hasty legislation has been attempted. In a recent article on the subject, Dr. W. C. Rucker, assistant surgeon general of the United States Public Health Service, Washington, D. C., and secretary of the Committee on Education and Extension of the American Genetic Association, reported that four States were considering sterilization legislation, and that nine contemplated eugenic restrictions on marriage. Dr. Rucker considered none of the proposed laws satisfactory from a eugenic standpoint. An excellent report and criticism of eugenic legislation was recently issued by the University of Washington (*Bulletin* No. 82, Seattle, Wash., May, 1914). The conclusion was therein reached that in many respects a considerable portion of the legislation discussed was so out of date from a biological point of view that it was really worse than useless.

For standard treatment of the subject of eugenics the reader is referred to the list appended to the article EUGENICS in the YEAR BOOK for 1914. From the large number of recent books, reports, and articles, not heretofore cited, the following are selected as particularly worthy of attention: *Defective Children*, by T. N. Kelynak, M.D. (London, 1915); *Geburten-Rückgang und Geburten-Regelung*, by Prof. A. Grotjshu (Berlin, 1914); *Heredity and Environment in the Development of Men*, by E. G. Conklin, professor of biology, Princeton University (Princeton University Press, 1915); *Human Derelicts, A Collection of Medico-Sociological Studies*, by T. N. Kelynak, M.D. (London, 1914); *The Next Generation, A Study in the Physiology of Inheritance*, by F. G. Jewett (New York, 1915); *The Progress of Eugenics*, by Dr. C. W. Saleeby (New York, 1914); *The Truth About War Babies*, by John M. Rehart, honorary secretary National Birth-Rate Commission (London, 1915); *Bulletins of the Eugenics Record Office*: No. 12, "The Feebly Inhibited: Violent Temper and Its Inheritance" (September, 1915); No. 13, "How to Make a Eugenic Family Study" (June, 1915); No. 14, "Hereditary Fragility of Bone"

(November, 1915); *The Training School Bulletin*, especially vol. xii, No. 4, June, 1915, containing "The Examination of 1097 Children in the Public Schools of Cleveland, Ohio," "A Study of 150 Delinquent Boys," "The Relation of Delinquency and Criminality to Mental Deficiency," "The Celibate Woman of To-day," by Earl Barnes (*Popular Science Monthly*, June, 1915); "Education and Race Suicide," by R. J. Sprague (*Journal of Heredity*, April, 1915); "Mental Tests," by C. Burt, in *Child Study* (February, 1915); "Misconceptions of Eugenics," by S. J. Holmes (*Atlantic Monthly*, February, 1915); "Political Aspects of Eugenics," by H. S. Shelton (*Contemporary Review*, January, 1915); "The Scientific Claims of Eugenics," by T. More (*Hibbert Journal*, January, 1915).

EURIPIDES, PERFORMANCES OF, IN ENGLISH. See **DRAMA**. AMERICAN AND ENGLISH.

EUROPEAN WAR. See **MILITARY PROGRESS**; and **WAR OF THE NATIONS**.

EVANGELICAL ASSOCIATION. A religious denomination principally composed of German-born citizens of the United States. Its doctrines are in many respects similar to those of the Methodists. Its communicants belong to nearly all parts of the northern section of the United States and Canada, and there are also many to be found in the West and South. The missionary work of the Association is carried on chiefly among the Italian immigrants. In 1915 the denomination had 115,243 communicants, 1663 churches, and 1031 ministers. The Church is divided for administrative purposes into 24 districts, has over 175,000 pupils in its Sunday schools, and a Young People's Alliance whose membership numbers over 50,000. A preaching house is maintained in Cleveland, Ohio, and there are several philanthropic institutions and hospitals in Chicago, Philadelphia, and cities throughout the Middle West. Northwestern College, Naperville, Ill., is the leading educational institution.

EXCESS CONDEMNATION. See **CITY PLANNING**.

EXHIBITIONS, ART. See **PAINTING AND SCULPTURE**.

EXPERIMENTAL PSYCHOLOGISTS, ASSOCIATION OF. See **PSYCHOLOGY**.

EXPERIMENT STATIONS. See **AGRICULTURAL EXPERIMENT STATIONS**.

EXPLORATION. (For Arctic and Antarctic exploration see **POLAR RESEARCH**.) During the year 1915 not only have no new and extended schemes of exploration been initiated, but several have been recalled or postponed. Additions along lines of geographical knowledge are largely due to expeditions which were already in the field in 1914. Among these the most important are Shackleton's southern voyage for the purpose of crossing the Continent of Antarctica, from Weddell Sea to McMurdo Sound; the archaeological researches of Stein in the deserts of central Asia; the discovery of new land by Stefansson in Arctic America; and the making of the Northeast Passage from the Pacific Ocean to the White Sea by Vilkitzsky.

AFRICA. When war conditions arose explorations practically ceased in Africa, where, however, the areas of unknown regions are becoming limited. French researches have continued to some extent. The most notable is probably the surveys of Henry Hubert, by journeys of 2500 miles, of the geology of the Ivory Coast. Be-

sides his general geological map of western Africa, this scientist has completed geological maps of colonies in Senegal, Guinea, Dahomey, Upper Senegal, and Niger. Great extensions of railway systems will facilitate future explorations. Notable is the completion of the Trans-African Railroad from Kabolo, on the Congo, to Lake Tanganyika, which already had rail connection with the port of Ujiji.

NORTH AMERICA. (For the explorations of Bernier, McMillan and Stefansson, see *POLAR RESEARCH*. For Alaskan work, see *ALASKA*.) With its strictly limited regions of unknown territory, North America has been comparatively neglected, except in the Dominion of Canada. The most interesting work in that country is the rediscovery in Hudson Bay of the lost islands of Gerritz' chart (1612), discovered by Hudson in his last voyage (1610-11), concerning which there have been much doubt and discussion. R. J. Flaherty has skirted this group, which lies to the north of James Bay, between 55° and 60° north latitude. The largest of the three islands is 100 miles in length, and the area of the group is about 4000 square miles. The most notable discovery in the United States is the Sun Temple, unearthed in the Mesa Grande Park by Dr. J. W. Fewkes. Built as early as 1300, for religious and ceremonial purposes, it is the most striking prehistoric ruin in America. Its 25 rooms are enclosed by walls 4 feet thick and over 1000 feet in length.

SOUTH AMERICA. The Bolivian-Brazilian Boundary Commission has completed its exploration and delimitation of the boundary of the two countries along the Abuma, the Madeira and the Raquirran rivers. Between July and October, 1914, Dr. Farabee explored portions of the valley of the Upper Amazon, giving special attention to the tribes living in the watersheds of the Ucayale and adjacent streams. In March, 1915, he began a journey from the Upper Purus River for the purpose of skirting the unknown frontiers of Brazil, Bolivia, and Peru. Among additions to the geographic literature of 1915 is the astonishing report of Maj. P. H. Fawcett on his explorations of extensive and hitherto unvisited forest areas of Bolivia. He states that in regions distant from the navigable rivers, there are numerous large tribes, aggregating "at least 100,000 savages," who have had no contact with white men. These tribes are for the most part anthropophagus, wage continuous wars, and generally live in communal fashion. Within 15 leagues of the provincial capital of Santa Cruz there are hostile savages yet living under Stone Age conditions. Savage tribes have also barred from travel the Mamore and Heat rivers. Professor Bingham made in 1915 his fifth expedition to South America. His Peruvian researches were pursued in the valleys of the Apurimac and Urubamba rivers. In addition to geographic and archaeological work, large collections were made of new and of ancient food plants.

ASIA. During Dr. Filippi's recent explorations, he discovered that the Remo Glacier, on the crest of the Karakoram Range between Cashmir and Afghanistan, drains both into the interior of Asia and also into the Indian Ocean. It proves to be the source of the Yarkand, an affluent of the Tarim River to the northeast, and of Stryok, the main tributary of the Indus to the southwest. An English-American expedition has made an ethnological exploration of the

valley of the Lower Yenesei, under Miss Czapliska, Oxford University, and Mr. Hall, University of Pennsylvania. Studying first the Samoyeds, the party wintered with the Tungus, a very primitive folk, and subsequently made researches among the Tartars.

Sir Aurel Stein's recent discoveries in East Turkestan have been extensive and important. He began his explorations from Tun-huang, southeast of the Gobi Desert, where he visited the temple of the Thousand Buddhists. Thence he traced for 250 miles, across a sterile desert, an ancient wall of China which was erected at least a century before the beginning of the Christian era. This wall was built with great engineering skill of reed and brushwood fascines, filled with clay or gravel. It was surmounted with watch-towers, etc., and abundant remains were found of the soldiers who occupied it as a defensive force. It appears that the adjacent sterile regions had been made habitable by extensive irrigation systems. Stein explored thoroughly the ruins of Khara Koto, which he identifies with Marco Polo's city of Etzina, the ancient outfitting station of merchants making the 40-day march across the desert to Karakoram, the old capital of Mongolia. Among the ruins were found Buddhist manuscripts and prints, frescoes, stuccos, reliefs, records on paper, coins, ornaments, etc. He also explored the region around Turfan, mapped large areas of the Dry Mountains, and portions of the former bed of the Oxus. Although turned back by the war, the Voisins, Segalen, Lartigue (French) expedition succeeded in reaching as far west as Li-kiang-fou, on the Yangtse in Yunnan, Western China. The Smithsonian expedition for biological research along the Siberian coast, under Koren, obtained a large collection of birds and of Arctic fossils.

EUROPE. Some additions have been made to a knowledge of the Kola Peninsula, by the survey and construction by the Russian government of a railway from Vologda, on the Petrograd-Archangel Railroad, northward to Kola on the Northern Coast, thus affording an ice-free harbor.

OCEANIC. The Coast and Geodetic Survey, continuing its work of offshore exploring, has located the edge of the continental shelf along a large part of the South Atlantic Coast. The 100-fathom curve lies quite far seaward, extending in some instances into the Gulf Stream. The wire-drag operations of the Survey have covered 214 square miles in Alaskan waters and 250 in the Atlantic. Surveys in the Philippines disclose the existence of a submerged range of coral mountains, extending southwesterly for 200 miles from the south end of Panay. The Cagayenes and other small islands are the summits of the coral range. The Sulu Sea is divided into two deep basins, wherein a maximum depth of 18,294 feet was found. Hydrographic surveys of the delta of the Obi resulted in the discovery of a deep channel through which sea-going ships of deep draught can ascend the river, thus opening interior Siberia to sea-traffic. Exploration in the field of terrestrial magnetism has been continued during 1915 under the direction of Dr. Bauer of the Carnegie Magnetic Institute. The Carnegie Institute's work included observations at more than 200 sea-stations, and extended from 60° N. latitude, in Bering Sea, to Port Lyttleton, N. Z., in the Southern Hemisphere.



OPENING OF THE EXPOSITION ON JANUARY 1, 1915

Centre group from left to right: G. Aubrey Davidson, President of the Exposition; William G. McAdoo, Secretary of the United States Treasury and personal representative of President Wilson; and Lyman J. Gage former Secretary of the United States Treasury, and Chairman of opening ceremonies



© Panama-California Exposition

EXPOSITION GROUNDS FROM A SPANISH BALCONY OVERLOOKING THE SEA
PANAMA-CALIFORNIA EXPOSITION, SAN DIEGO

EXPLOSIVES AND MUNITION FACTORIES. See UNITED STATES AND THE WAR.

EXPLOSIVES. See CHEMISTRY, INDUSTRIAL, section so entitled.

EXPOSITIONS. During the year two great international expositions have been held in the United States: the Panama-California Exposition in San Diego, Cal., and the Panama-Pacific Exposition in San Francisco, Cal.

PANAMA-CALIFORNIA EXPOSITION. This was held in San Diego, Cal., and the history of its inception and development has been given in the *YEAR BOOKS* for 1911, p. 247; 1912, p. 216; 1913, p. 236, and 1914, p. 235. It was opened on January 1st, with appropriate ceremonies, including an address by the Hon. William G. McAdoo, who represented President Wilson on that occasion. The beauty of the exposition has impressed those who have visited it and its influence in bringing about a greater appreciation of the possibilities of the Spanish Colonial architecture will be its lasting lesson. On December 4th, an official announcement was made that the Panama Exposition, opened on Jan. 1, 1915, would continue throughout 1916 as the Panama-California International Exposition. The 1916 exposition will open on January 1st, the day following the official closing of the 1915 fair. Foreign exhibits valued at several million dollars, from the Panama-Pacific Exposition in San Francisco, just closing, are to be brought to San Diego. Two of the largest exhibits at the San Francisco Exposition—the Canadian and the Italian—have been obtained, and other exhibits promised are the French, Swiss, Spanish, Netherlands, and Russian. See also *ARCHITECTURE*.

PANAMA-PACIFIC EXPOSITION. (See *YEAR BOOKS*, 1912, p. 216; 1913, p. 236; and 1914, p. 236.) This exposition was held in San Francisco, Cal. The touching of a button by President Wilson in the White House gave the electric signal that opened the exposition exactly at noon, Pacific time, on February 20th, which was made a legal holiday throughout California. The exercises included addresses by Hon. Franklin K. Lane, who represented President Wilson, Gov. Hiram W. Johnson, and Charles C. Moore, president of the exposition. The exposition continued until midnight on December 4th, when President Moore closed the festivities by pressing a button that turned off the electric display. The following words are from the message which President Wilson sent to the formal closing exercises:

"The Panama-Pacific International Exposition: which in its conception and successful accomplishment gave striking evidence of the practical genius and artistic taste of America; which in its interesting and unusual exhibits afforded impressive illustration of the development of arts and peace; and which in its motive and object was eloquent of the new spirit which is to unite East and West and make all the world partners in the common enterprises of progress and humanity." Thirty-nine foreign nations and 37 States and 3 Territories of the American Union were represented at the exposition. It was estimated that there were 80,000 exhibitors whose displays were valued at \$350,000,000. The daily attendance, which averaged about 62,000, began with 245,143 on the opening day and reached its highest number—348,472, on November 2nd, San Francisco Day. The total was 18,413,399. There were 800 congresses and conventions held

during the life of the exposition. The financial results of the exposition were most satisfactory. In abbreviated form the data are as follows: cost of exposition to opening, \$18,365,193.69; income to opening, \$16,988,555.79; deficit on opening, \$1,376,637.90; operating surplus of exposition period, \$2,571,807.79; estimated net profit on closing, \$1,195,169.89; estimated net loss of wrecking period, \$160,000; and estimated final net profit, \$1,040,000. In addition to this surplus the exposition has paid for and given to the city the Municipal Auditorium, in the Civic Center, at a cost of \$1,086,000, and the \$50,000 pipe organ now in Festival Hall. In January Congress passed a law permitting the minting of special coins commemorative of the exposition as follows: Three thousand 50-dollar pieces; 10,000 2½-dollar pieces; 25,000 1-dollar pieces, all in gold, and 200,000 half-dollar silver pieces. The law permitted the mint to deliver these coins at their par value, and the exposition was authorized to put its own selling price on the coins. See also *ARCHITECTURE*; and *PAINTING AND SCULPTURE*.

OTHER EXPOSITIONS. Among minor and local expositions held in the United States may be mentioned the First National Exposition of Chemical Industries held in New York City during September 20-25. It is described under *CHEMISTRY, INDUSTRIAL* (q.v.). The expositions held abroad during the year include the British Industries Fair in London, England, during May 10-21; the Canadian National Exhibition in Toronto, Canada, during August 28-Sept. 13; the Swiss Exposition of Toys in Zurich, Switzerland, during October; and a traveling exposition, the proceeds of which were designed for the care of war cripples and invalids under the auspices of the Red Cross Society during the autumn in Berlin, Breslau, Budapest, Magdeburg, and Cassel. In the Orient the second annual exhibition of Siamese agriculture and domestic manufactures was held in Bisanuloke, Siam, during March 17-21; a Chinese National Exposition was opened in Peking on October 10th; an Industrial Competitive Exhibition was held in Seoul, Chosen, during September 10-October 31, and a Japanese Exposition was held in Santiago, Chile, during September.

COMING EXPOSITIONS. The opening of the National Exposition of Panama has again been postponed until Jan. 21, 1916. An International Exposition of Electrical Appliances and also a general Spanish Exposition is announced as in preparation to be held in Barcelona, Spain, during 1917. Announcement is made of the organization of committees for the preparation of a celebration in 1916 of the 250th anniversary of the founding of the city of Newark, N. J., and of the 200th anniversary of the founding of San Antonio, Texas, by the Franciscan monks. See also *ARCHITECTURE*.

FABRE, JEAN HENRI, a distinguished French entomologist, died at Orange, France, on Oct. 11, 1915. He was born at St. Léons, Avignon, in 1823, taught for several years in the Lycée of Avignon, and was afterward professor of physics at the College of Ajaccio. Later he retired to Lérignan, where he wrote his greatest work, *Souvenirs entomologiques* (10 vols. 1879-1907), which was crowned by the Institute. His other works are: *La science élémentaire, a series of lectures* (1862-65); *Histoire de la bûche* (1866); *Notions préliminaires de phy-*

sique (1867-70); *Le Livre d'histoires* (1868); *Les ravageurs* (1870); *Astronomie élémentaire* (1872); *Les auxiliaires* (1873); *Lectures scientifiques: zoologie* (1873); *Botanique* (1874); *Premiers éléments de physique* (1874); *De chimie* (1875); *De science naturelle* (1875); *Les serviteurs* (1875); *La plante* (1875); *L'Industrie* (1875); *Cours complet d'enseignement littéraire et scientifique* (1876); *Livre des champs* (1879); *Les inventeurs et leurs inventions* (1880); *La vie des insectes* (1910). Fabre was made a corresponding member of the Institute and a chevalier of the Legion of Honor. Parts of his writings have been published in English, as *Insect Life* (1901); *The Life and Love of the Insect*, translated by A. T. de Mattos (1911); *Social Life in the Insect World*, translated by Bernard Miall (1913); *The Life of the Spider* and *The Life of the Fly*, translated by A. T. de Mattos (1913).

FAILURES. See FINANCIAL REVIEW, section so entitled.

FALABA CASE. See UNITED STATES AND THE WAR.

FALKLAND ISLANDS. A British colony composed of a group of islands in the South Atlantic. They are East Falkland (3000 square miles), West Falkland (2300), and about 100 smaller islands (totaling about 1200 square miles). South Georgia, a group of islands 54½° S., with an area of about 1000 square miles, a great whaling station, is a dependency of the Falkland Islands. Inclusive of South Georgia the population numbered in 1911, 3275 (2370 males and 905 females). Estimated population Dec. 31, 1913, 3223. Sheep farming is the sole industry of the colony, the entire country being wild moorland fit for little besides pasture. There are no trees. There were in 1913 about 698,000 sheep, 7821 cattle, and 3528 horses. Hides, skins, horns, hoofs, bones, tallow, wool, and guano are the exports. Whale produce exported in 1913 was valued at £1,252,932, of which £443,378 from South Georgia. Imports and exports for 1913 were valued at £239,222 and £1,460,219 respectively (£93,913 and £471,156 in 1911). The United Kingdom contributed imports valued at £152,958, and received exports £750,994. Total tonnage entered and cleared, 500,449 (315,278 in 1911). Revenue, 1913, £42,929 (1911, £35,349); expenditure, £25,238 (£22,460). There is no public debt. The only town is Stanley, with about 950 inhabitants. It has a fine inner and outer harbor and is a coaling station for vessels rounding Cape Horn. Beyond the town limits there are no roads. The islands were taken by Great Britain in 1832 for the protection of the whale fisheries. Dependencies besides South Georgia are the South Shetlands, Graham's Land, the South Orkneys, and the Sandwich group.

FARABEE, DR.—HIS EXPLORATIONS. See EXPLORATION, *South America*.

FARATSIIHITE. See MINERALOGY.

FARMERS' INSTITUTES. See AGRICULTURAL EXTENSION WORK.

FARMING. See AGRICULTURE.

FAWCETT, MAJOR P. H.—HIS EXPLORATIONS. See EXPLORATION, *South America*.

FEDERAL COUNCIL OF THE CHURCHES OF CHRIST IN AMERICA. The council officially unites in its activities 30 Protestant denominations, including 139,000 churches with 17,500,000 members. During 1915

the established lines of activity were maintained by the council in State and local federations, foreign missions, home missions, religious education, social service, evangelism, Sunday observance, temperance, and peace and arbitration. The council promoted a religious exhibit and conducted a continuous religious campaign at the Panama-Pacific Exposition, with evangelistic meetings, daily lectures, and conferences. In aid of the promotion of international friendliness through the churches, 400,000 books and pamphlets were distributed and 170,000 letters sent out. A Christian embassy to Japan was well received, and an investigation was conducted on the Pacific Coast concerning the Japanese problem in the United States. Delegates afterward came from Japan for fraternal conference with American workers. A committee on the special interests of the colored denominations was projected. The general secretary, Rev. Charles S. MacFarland, visited Holland, Switzerland, England, France, and Germany, representing the United Churches on 25 national committees; and he addressed over 100 conferences. The council's year ended free of debt, but it was admitted that the growing demands of the work call for much larger expenditure in 1916. The annual meeting of the executive committee of the council was held at Columbus, Ohio, on December 8-10th, was attended by 1150 members and delegates, and was addressed by the President of the United States. The administrative committee is in close and constant communication with the churches of the belligerent nations of Europe, looking toward future opportunities of reconciliation, a delegation being in readiness to go to Europe at the earliest opportunity.

The denominations affiliated with the Federal Council are as follows: Baptist (North), Free Baptist, Christian, Congregational, Disciples of Christ, Evangelical Association, Evangelical Synod, Society of Friends, Lutheran General Synod, Methodist Episcopal Church, Methodist Episcopal Church (South), German Evangelical Synod, National Baptist Convention (colored), the Mennonite Church, the African Methodist Episcopal Church, the African Methodist Episcopal Zion Church, the Colored Methodist Episcopal Church in America, the Methodist Protestant Church, the Moravian Church, the Presbyterian Church in the United States of America, the Presbyterian Church in the United States (South), the Primitive Methodist Church, the Protestant Episcopal Church, the Reformed Church in America, the Reformed Church in the United States, the Reformed Episcopal Church, the Reformed Presbyterian Church (General Synod), the Seventh Day Baptist Church, the United Presbyterian Church, the United Brethren Church, the United Evangelical Church, the United Presbyterian Church, and the Welsh Presbyterian Church.

FEDERAL RESERVE BANKS. See BANKS AND BANKING.

FEDERAL RESERVE SYSTEM. See BANKS AND BANKING, under the section so entitled.

FEDERAL TRADE COMMISSION. See TRUSTS.

FEDERATED MALAY STATES. A British protectorate composed of four states in the Malay Peninsula, as follows (area in square miles, population census of 1911):

	<i>Sq. m.</i>	<i>1911</i>	<i>Capital</i>
Perak	7,800	494,057	Taiping
Selangor	3,156	294,035	Kuala Lumpur
Negri Sembilan...	2,550	130,199	Seremban
Pahang	14,000	118,708	Kuala Lipis
F. M. S.	27,506	1,036,999	Kuala Lumpur

See articles on the separate states for individual production. A table of commercial and financial statistics follows, values in Straits Settlements dollars (1 Straits Settlements dollar = \$0.56776) for 1913:

	<i>Imps.</i>	<i>Exps.</i>	<i>Rev.</i>	<i>Expend.</i>
Pk.	34,286,777	71,402,985	23,970,058	25,804,040
S.	42,890,846	56,897,277	15,561,895	16,725,848
N. S.	6,462,551	13,862,762	3,071,799	2,681,530
Pg.	3,268,988	7,006,474	1,729,459	2,076,168

There is no public debt. Railway lines in operation (1914), 771 miles, including 37 miles opened in 1913. The Railways Administration controls the line in the Malay Peninsula, including the Johore State Railways, leased since January, 1912. In 1913 the Singapore Railway had 20 miles in length, which had been leased to the Railways Administration from the colonial government from January, 1912, at a rental of \$150,000, and was purchased for \$4,136,000.

In 1909 a Federal Council was created by an agreement between the high commissioner and the four native rulers, to consist of the high commissioner, the chief secretary, the sultans of Perak, Selangor, and Pahang, the yam tuan of the Negri Sembilan, the four British residents, and four unofficial members nominated by the high commissioner. The first meeting was held Dec. 11, 1909, at Kuala, Kangsar. The Council meets annually, the high commissioner (Sir Arthur Young) presiding.

FEDERATION OF JEWISH FARMERS OF AMERICA. See AGRICULTURAL CREDIT.

FEDERATION OF LABOR, AMERICAN. See LABOR, AMERICAN FEDERATION OF.

Feeble-mindedness. A recent publication issued by the Ohio Board of Administration is of considerable value in relation to the country-wide problem of the feeble-minded. It has been estimated that from 300,000 to 400,000 persons in the United States, equivalent to 0.3 per cent of the population, are feeble-minded, and of these not over one-third are under custodial care. In Ohio there are between 10,000 and 15,000 feeble-minded children, less than 20 per cent of whom are in institutions devoted particularly to their care. Others are to be found in infirmaries, reformatories, and prisons, and others help to swell the number of juvenile delinquents. A mental examination of the inmates of the Girls' and Boys' Industrial School and Home showed that 59 out of 100 girls examined were feeble-minded, 14 were borderline cases, 13 mentally retarded, and only 14 normal. In the case of the boys, out of 100 examined, 46 were feeble-minded, 26 borderline cases, 11 mentally retarded, and 11 mentally normal. The findings in Ohio coincide with those in other States and indicate that from 60 to 80 per cent of the feeble-mindedness is due to bad heredity. This report takes the view that the attempt to discipline and train defective children and then return them to society, is futile. They can never be brought up to normal and to turn them loose on the public

is a blunder, both moral and economic. If both parents are feeble-minded, all their numerous progeny will be mentally defective; while at least one-half of the children will be mentally defective if but one parent is feeble-minded. These people are classified as borderline cases, morons, imbeciles of three grades, and idiots of three grades. They are all instances of arrested mental development, while the insane have retrograded from normal mentality through disease.

FEMINISM. See WOMAN MOVEMENT; and WOMAN SUFFRAGE.

FENCING. The twenty-second annual inter-collegiate fencing tournament was won by the United States Naval Academy. Columbia, which captured the championship in 1914, finished second, and the University of Pennsylvania, third. The individual winners were: foils, H. B. Van Buskirk, Pennsylvania; sabres, R. D. S. Horne, United States Naval Academy.

Dual college competitions resulted as follows: Yale 9, Bowdoin 0; Yale 8, Columbia 1; Yale 5, Harvard 4; Yale 5, Pennsylvania 4; Columbia 5, Pennsylvania 4; Cornell 7, Columbia 2; Cornell 8, Michigan 1; United States Naval Academy 6, Cornell 3.

In the national championships held by the Amateur Fencers' League, Sherman Hall of the New York A. C. won with the foils and J. A. McLaughlin of the Washington Fencers' Club excelled with the duelling swords. The woman's championship with the foils was captured by Miss Jessie Pyle.

FERTILIZERS. To just what extent the supply, price, and use of fertilizers were affected by the disturbed conditions of trade during the year 1915 it was impossible to say at the end of the year, since complete and reliable statistics of the fertilizer industry were not available. Some outstanding features of the situation were the shortage and high price of potash, an advance in the price of nitrate, and a shortage of sulphuric acid for the manufacture of super-phosphates.

POTASH. A large part of the world's supply of potash was cut off by the German embargo in 1914, at a time when there was a greatly increased demand for potash for the manufacture of munitions. The result was such a decrease in the amounts available for agriculture and such an advance in price as to make the use of potash salts as fertilizer in large measure prohibitive. The United States was probably the greatest sufferer from this cause. Normally the United States used about \$14,000,000 worth of German potash salts annually besides \$1,000,000 worth of potassium nitrate obtained indirectly from India. The situation created by the failure of the German supply of potash added impetus to the search for other sources of supply and stimulated inquiry as to practical means of meeting the emergency without impairment of the productiveness of the soil. Attention therefore was directed toward the more liberal use of substances such as lime, gypsum, salt, decaying organic matter, etc., and more thorough tillage, which was believed to increase the availability of the soil potash. These of course were only temporary expedients and would at best only partly meet the needs of the situation. On the other hand, the shortage of potash may in the end prove a distinct advantage to agriculture in that it will force a more careful study of the fertilizer needs of soils with reference to potash

and lead to a more discriminating and profitable use of potash fertilizers. There was good reason to believe that there was a large waste in the use of such fertilizers on lands which did not need them, and hence did not make a profitable return for their use. Many of the soils of the United States are abundantly supplied with potash. Good tillage and the liberal use of decaying organic matter are probably the most effective practical means at the command of the farmer of increasing the availability of this soil potash. Recent investigations indicated that the common estimate of the effectiveness of lime for this purpose was greatly exaggerated. All farm supplies of potash, such as ashes, straw and crop residues, manure, etc., should, of course, be conserved.

It seemed certain that conditions created by the European war would result in the development and permanent establishment of other commercial supplies of potash besides those of Germany. The information available indicated that the potash deposits of Spain are of such extent and character as to warrant the expectation that they will ultimately supply more than the home demand. The inquiries conducted under government auspices in the United States made it plain that America could develop an abundant domestic supply of potash when the commercial conditions justify the investment of the necessary capital. The sources of supply are abundant and the more important technical problems have in most cases been worked out. The four most promising of these sources of supply are considered to be: (1) the giant kelps of the Pacific Coast, the beds of which are more than 400 square miles in extent and are estimated to be capable of yielding, with careful harvesting, six to seven times the normal demands of the United States; (2) the alunite deposits, mainly in the mountains of Utah; (3) the feldspars of the Eastern United States; and (4) the saline muds of Searles Lake in California.

Up to the end of 1915 there was a reluctance to invest capital in the kelp potash industry on account of uncertainty in regard to the State laws governing the harvesting of the kelp. One plant was constructed and another was planned for the production of potassium sulphate from alunite. In addition to the potassium sulphate it is possible to produce a fair grade of alumina and sulphuric acid, which, under favorable conditions, would constitute valuable by-products. An obstacle in the way of the most successful utilization of this source of potash seemed to be the remoteness from commercial centres of the great deposits which were to be used. Inquiry with reference to the production of potash from feldspars had gone far enough to show that this is feasible if a salable by-product, as, for example, cement, could be secured at the same time. Of the large number of desert basins which had been explored in the United States Searles Lake was the only one which seemed to be commercially promising. The brine obtained here contains from 5 to 6 per cent of potash as chloride, but its impurity presents certain serious technical difficulties in preparing pure salts. Development of the industry here was delayed by doubt and litigation as to the title to the property. From none of the sources named was the shortage of potash for agricultural purposes likely to be relieved for many months to come even under most favorable circumstances. The situation,

therefore, had to be met by conservation and discriminating use of such supplies as were available.

In order that the many important experiments with fertilizers in progress in the United States may continue without hindrance an attempt is being made to arrange for the import of a sufficient amount of potash salts for these experiments, the Secretary of Agriculture acting as consignee and guaranteeing that the salts shall be used only for experimental purposes and not sold.

PHOSPHATES. Phosphates are the normal basis of practically all fertilizers since phosphorus is probably the fertilizer constituent most generally needed by soils. Fortunately the world's supply is abundant. The United States especially contains a practically inexhaustible supply of high-grade phosphates. It is becoming increasingly desirable, however, to find practical methods of utilizing more completely the large supplies of low-grade phosphates, and, in general, to improve the methods of manufacture of soluble phosphates. The United States Department of Agriculture was systematically investigating these questions as well as the economic justification of the use of untreated rock. The systematic examinations of the enormous phosphate deposits of the Western United States were continued by the United States Geological Survey with a view to withdrawing from entry and reserving under government control lands underlain by high-grade phosphate. On Jan. 1, 1915, the total area of phosphate lands withdrawn from public entry in Montana, Utah, Wyoming, and Idaho was 2,713,150 acres, constituting perhaps the largest area of phosphate rock yet recognized in the world.

NITROGEN. The nitrogen supply for fertilizers was affected to a marked extent during the year by the greatly increased demand for nitric acid for the manufacture of munitions of war. The conditions stimulated the study of additional means of meeting the need for nitrogen compounds. This is being done partly by the increased use of by-products of coke ovens to save the ammonia produced in coking, the development of processes of fixing the nitrogen of the air, and more intelligent use of city and industrial wastes, especially garbage and sewage sludge. It was found that the two latter can be made to furnish useful components of fertilizers without interfering with the requirements of sanitary disposal. The search for new surface deposits of nitrates had not yielded results of commercial importance.

It is well known that farm manure is subject to large loss of nitrogen under ordinary methods of handling, but the cause of this loss had not been clearly understood. Investigations in England showed that the explanation was to be found in the fact that alternate wetting and drying of the manure causes reduction of nitrates formed on the surface of the manure and consequent loss of nitrogen in the free state. This teaches the practical lesson that if manure can not be promptly spread on the land as it is produced it should be stored under cover and kept as uniformly moist as possible. Another fact of considerable practical importance brought out by experiments with manure was that small amounts of manure might be instrumental in increasing to a considerable extent the effectiveness of green manures, especially leguminous

green manures, by furnishing active bacteria to hasten their decomposition in the soil.

RADIOACTIVE FERTILIZERS. That radium exerts a marked influence upon plant growth was shown by plant physiologists very soon after radium was discovered and its properties began to be studied. Following this discovery the use of radioactive materials as fertilizers was suggested. The results of experiments with such materials, however, up to 1915 was contradictory and inconclusive. Several reports on experiments of this kind, reaching entirely contradictory conclusions, appeared in 1915. Those who had investigated the subject most fully were of the opinion that the amounts of radium which could actually be supplied in this way at prices which would not be prohibitive do not and can hardly be expected to produce any effect upon crop yields. Moreover, as Hopkins pointed out, even if such materials proved effective their use should be adopted with caution since they add nothing to the soil but by stimulating plant growth hasten the exhaustion of the soil.

SULPHUR. Investigation called attention to the fact that sulphur is frequently deficient in soils and suggested that it is possibly a more important element of soil fertility than has commonly been supposed. A number of investigations on the fertilizing effect of sulphur and its compounds were reported. These showed that with certain soils relatively deficient in sulphur the addition of sulphur compounds measurably increase the growth of certain plants, notably legumes and crucifers. Elemental sulphur had not proved as effective as sulphates for this purpose. It was suggested that the beneficial effect observed might be due in part to stimulation of bacterial activity in the soil.

See also **CHEMISTRY, INDUSTRIAL, Utilization of Peat, and passim.**

FESTIVALS, MUSICAL. See **MUSIC.**

FIJI ISLANDS. A group of South Pacific islands; a British crown colony. The principal inhabited islands are Viti Levu (4112 square miles), Vanua Levu (2432), Taviuni (217), Kadavu (124), Koro (58), Gau (45), and Ovalau (43). Total area, including the dependency of Rotumah (14), is 7435 square miles, a little larger than the combined area of Connecticut and Delaware. Estimated population, Dec. 31, 1913, 153,704. The population at the 1911 census was 139,541 (80,008 males, 59,533 females), of whom 87,096 Fijians, 40,286 (26,073 males) East Indians, 3707 Europeans. Sugar, copra, and fruit (particularly pineapples) are the chief products and exports. Total imports 1913, £903,968 (1910, £870,120); exports, £1,425,940 (£1,005,818). Export of sugar, £1,041,927 (£669,432); copra, £176,741 (£258,914); fruit, £168,249 (£47,301). There is no railway. Suva, the capital, has cable communication with Brisbane and with Canada. Revenue, 1913, £266,031 (£211,952 in 1910); expenditure, £324,528 (£236,661). Public debt, £71,915.

FILIPPI, DR.—HIS EXPLORATIONS. See **EXPLORATION, Asia.**

FILTRATION. See **WATER PURIFICATION.**

FINANCE. See sections so entitled under various countries, and under the States of the United States. See also the article **FINANCIAL REVIEW.**

FINANCIAL REVIEW. Under this topic is included a statement of the general aspects of business during the year together with some

treatment of such special topics as the stock exchange, foreign trade, bank clearings, building operations, failures, and business conditions in the particular countries. For additional information relating to business and finance the reader is referred to the following topics: **AGRICULTURAL CREDIT; BANKS AND BANKING; BLUE SKY LAWS; COTTON, Cotton Futures Act; INSURANCE; NATIONAL BANKS; PRICES; SAVINGS BANKS; STATE BANKS; TARIFF; TRUSTS.** See also **LABOR** and various articles there referred to.

GENERAL CONDITIONS. The year 1915 was one of very marked and decisive recovery from the industrial depression of the preceding year, the tide of business operations rising steadily throughout the entire twelve months. Some signs of approaching prosperity had begun to appear at the close of 1914, but that business was still at a low ebb at the opening of the year is shown by the fact that the output of pig iron in December, 1914, was only 1,500,000 tons, the net earnings of the United States Steel Corporation in the fourth quarter of 1914 were less than \$11,000,000, steel mills of the country were working at only 60 per cent of capacity with thousands of idle workmen, steel prices averaged \$2 per ton less than in 1913, railroad earnings were low, and business failures were large. By contrast in 1915 the output of pig iron rose to 3,125,000 tons in October, an amount never before equaled; prices of steel products were high, but steel plants were running at full capacity and were rejecting orders; net revenues of the Steel Corporation rose from \$12,500,000 in the first quarter to \$28,000,000 in the second, and \$38,500,000 in the third. Foreign trade which in 1914 was less than in 1913 or 1912 rose to the unprecedented sum of \$5,290,000,000 in 1915, and exports of merchandise for the 12 months ending with October exceeded imports by the remarkable amount of \$1,626,886,000, and for 1915 by \$1,760,000,000. Likewise the volume of railway freight traffic during the fall of 1915 was never before equaled, some of the roads with Atlantic seaboard terminals being actually under the necessity of refusing freight for ocean shipment. As a result the stock quotations of railroad shares advanced generally 10 to 20 points. This great outburst of business and especially the great volume of orders from abroad for war munitions and supplies resulted in wild speculation on the stock exchange. During January the pessimism of the preceding year gradually gave way to a more hopeful sentiment. Exports were increasing; foreign countries, especially Canadian provinces and cities, Sweden, Norway, and Argentina, placed loans in the American market; the gold pool of \$100,000,000 to meet maturing American obligations abroad was dissolved and the pool for the relief of cotton growers likewise formed in the fall of 1914 became inoperative, only \$28,000 having been applied for; nearly all of the \$384,000,000 of emergency currency and of the \$215,000,000 of clearing house certificates that had been issued since August, 1914, were retired; the stock exchange was reopened, but trading was moderate, only 5,000,000 shares being transferred in January and 4,300,000 in February.

In the latter month the upward tendency became more marked. Exports exceeded imports by \$173,500,000, with the result that sterling exchange declined to \$4.79. This rate contrasted

sharply with the rate of \$7 which had been reached in August, 1914. During March the activities of the stock market increased owing to business conditions and to Supreme Court decisions favorable to the railroads. By one of these the two-cent passenger rate law of Virginia was annulled and by the other the reduction of freight rates on coal by North Dakota was set aside. New York City was able to float a sale of bonds at $4\frac{1}{2}$ per cent; copper rose to $15\frac{1}{2}$ cents per pound, an increase of more than 2 cents; cotton rose by a similar amount to 9 $\frac{1}{4}$ cents; while the price of wheat at Chicago was about \$1.60 per bushel. In April all minimum limits for stock exchange transactions were removed; steel plants were occupied to 70 per cent of capacity; the price of copper rose to 21 cents and the prices of wheat and cotton showed slight advances; but the striking feature of the month was the outburst of speculation on the New York exchange, 21,000,000 shares being transferred. This outburst was due mainly to war orders which resulted in large advances in Bethlehem Steel, American Locomotive, New York Air Brake, and the stocks of motor companies. In May there was some recession in the price of commodities; stocks declined, in part owing to the sinking of the *Lusitania*, but June brought recovery in stock prices. The decision of the Supreme Court against the dissolution of the Steel Corporation brought a favorable movement in stock prices, but the resignation of Secretary of State Bryan caused some reaction. The prices of sterling exchange had continued to fall and the importation of \$40,000,000 of gold did not prevent a decline to \$4.75. Copper prices continued to advance but the price of wheat fell to \$1.04.

The influences favorable to business revival during the first half year continued to operate during the second half. Large contracts with foreign governments for military supplies resulted in wild trading on the exchange in July; steel plants increased their business to 87 per cent of capacity; pig iron production increased and railroad traffic rose considerably. August was marked by the transfer of 20,500,000 shares on the New York exchange; by continued advances in the prices of railroad securities, due in part to the granting by the Interstate Commerce Commission of freight increases to the western roads; the enormous crops produced a favorable reaction on business in general. The decline of sterling exchange to \$4.50 was checked in September by the negotiation of the Anglo-French loan of \$500,000,000. It was during August and September that stock speculation was most reckless, the shares of some of the companies profiting by war orders gaining as much as 30 or 40 points in a day. It was during September also that the railroads began to feel a pressure of freight for export.

The fourth quarter of the year was characterized by the continued increase in the volume of business and the optimism of business sentiment. Another outburst of speculation in war order stocks resulted in the transfer of 28,679,000 shares in October, numerous days being marked by a business of from 1,000,000 to 1,500,000 shares. Bethlehem Steel made a phenomenal advance to 600, having opened the year at $46\frac{1}{4}$, and declining in December to about 460. There were similar but less extreme advances in some other stocks. Pig iron production made a new record

of over 3,000,000 tons in October, and by the middle of November the activity in the steel plants of the country was without precedent. This was due not only to the war orders, but to the fact that unprecedented business encouraged the railroads to spend large sums for cars, rails, and other equipment. The enormous export traffic at eastern ports forced the railroads to reduce free storage time from thirty to fifteen days, there being at one time 50,000 loaded cars on side tracks near New York. This congestion was due in part to the reduction in the number of ocean carriers by the war. In December the attention of the stock market turned somewhat to railroad securities, but considerable gains were still made in the stocks of the war order companies. In spite of the fact that certain roads had gone into receiverships, the relatively favorable condition of railway finances in general was shown by the statistics of the Bureau of Railway Economics. The net revenue per mile of line for roads comprising 228,000 miles rose from \$220 in January and February, to about \$300 per mile in each of the next three months, and to \$477 per mile in September. The net income for these roads in September was 17.4 per cent above the previous five-year average, and subsequent months were not less favorable. The increase in net revenue of railways over 1914 was estimated at \$168,955,000. The foreign trade for October totaled \$477,000,000 and for November, \$495,000,000. The excess of exports over imports reached the maximum of \$178,857,000 in October. During every month of the year there was an excess of gold imports over gold exports, the maximum of \$76,731,000 being in October and the total excess for the year being \$429,000,000. Moreover, extra dividends on the stocks of copper, oil, and powder companies were declared. Steel prices reached the high average of \$39.70 per ton, a gain of \$7.50 since August and of nearly one-third since 1915 and the highest average in eight years.

CROPS. Not a little of the great prosperity of the United States during 1915 was due to new records in farm production. Thus the wheat crop for the first time exceeded 1,000,000,000 bushels, the actual production being 1,002,029,000 bushels. This was an increase of 110,000,000 bushels over 1914. The corn crop exceeded that of the previous year by over 400,000,000 bushels, reaching the enormous amount of 3,090,000,000 bushels. Oats likewise set a new maximum of 1,517,478 bushels, while barley with 236,682,000 bushels was 20 per cent in excess of the 1914 crop. The total value of all farm products including grain, vegetables, fruits, and animal products for the year was estimated at \$10,000,000,000.

PIG IRON PRODUCTION. One of the best indexes of business conditions is the volume of pig iron production. During the last four months of the year this averaged about 3,000,000 tons. This contrasted with 1,801,000 tons in January. The output increased steadily every month until October, the total for the year being about 29,796,000 tons, an amount exceeded only in 1912 and 1913, and being about 6,500,000 tons greater than in 1914. The total for the year may be compared with a total of 30,724,000 tons in 1913; 29,727,000 in 1912; and 23,649,000 in 1911.

AUTOMOBILE INDUSTRY. A notable feature of the year's industry was the great expansion in the automobile manufacture. It was estimated

that the retail value of cars and trucks sold in 1915 aggregated \$691,778,000. This included 842,249 passenger cars at \$565,856,000; and 150,369 trucks at \$125,922,000. Exports were estimated at \$100,000,000 or two and one-half times as great as in 1914; of this sum about two-thirds was for commercial vehicles. See AUTOMOBILES.

STOCK EXCHANGE. The changes in business sentiment were reflected in the activities of the New York Stock Exchange, though this statement must be qualified on account of an excessive and unreasoning spirit of speculation which prevailed during April and during the fall months. It was this speculative fever which undoubtedly made the total shares exchanged for the year greater than in any year since 1909. The number of shares sold by months were as follows: January, 5,076,210, February, 4,383,449, March, 7,862,308, April, 21,022,930, May, 12,581,040, June, 11,004,042, July, 14,371,633, August, 20,432,350, September, 18,399,286, October, 26,678,953, November, 17,634,270, December, 14,647,000. Total for the year, 173,000,000 shares. That these figures represent an extraordinary volume of business is shown by comparison with totals for previous years: 1914, 47,900,568; 1913, 83,470,693; 1912, 131,128,425; 1911, 127,207,258; 1910, 164,150,061; 1909, 214,632,194. The speculative fever was also reflected in the phenomenal advances of some of the stocks. The advances were due almost entirely to the great volume of European trade due to war orders. The stocks of these companies came to be known popularly as "war brides." The following are a few instances of the advances during the year shown by first and last quotations of the prices of common stocks: Anaconda, 50 to 91; Baldwin Locomotive, 40 to 117; Bethlehem Steel, 46 to 459; General Motors, 82 to 500; Studebaker, 36 to 167; Industrial Alcohol, 20 to 121; Crucible Steel, 18 to 73; Continental Can, 40 to 84; Lackawanna Steel, 28 to 81; Tennessee Copper, 32 to 63. These prices were less in all cases than the maxima attained in the fall. Thus Baldwin Locomotive went to 154 on October 23rd; Bethlehem Steel to 600 on October 22nd; General Motors to 559 on December 9th; Studebaker to 195 on October 22nd; and Lackawanna Steel to 95 on September 29th. Toward the end of the year interest attached to railroad shares and the stocks of all the principal railroads of the country showed considerable advances with the exception of Missouri, Kansas and Texas, Missouri Pacific, and Wabash, which were in financial difficulties.

The bond market reflected somewhat the same wide-spread interests in investments. The transactions on the New York exchange by months were as follows: January, \$57,100,500, February, \$43,842,500, March, \$63,214,500, April, \$110,359,500, May, \$64,284,200, June, \$57,957,000, July, \$55,535,500, August, \$72,253,000, September, \$80,741,000, October, \$105,191,500, November, \$130,088,500, and December, \$120,110,000. Total for the year, \$956,500,000 par value. While the advances in bond prices were not phenomenal yet there was a general upward movement for the bonds of the government, of railroads, and of industrial companies, ranging from 1 per cent to 6 per cent. The total transactions for the year were exceeded in 1909, but not in any subsequent year. The

totals for immediately preceding years were: 1914, \$461,526,600; 1913, \$501,571,020; 1912, \$675,213,500; 1911, \$890,210,100; 1910, \$634,722,850; 1909, \$1,317,291,000. The ease of the bond flotations showed the abundance of available money due to the revival of prosperity and especially to the enormous export trade. In this connection reference should be made to the foreign credits established during the year and noted below. One notable result of the year's transactions was the increase in the number of stockholders of principal corporations. A summary for 23 railroads, 14 public utility companies, and 28 industrial corporations showed an increase of 25,447 in the number of stockholders during the year.

Another important result was the great absorption of American securities previously held abroad. When the war began the par value of American securities held abroad was estimated variously from \$4,000,000,000 to \$6,000,000,000. Mr. L. F. Loree, President of the Delaware and Hudson Company, after a thorough study of American railway securities held abroad, concluded that their par value was \$2,223,000,000, and their market value, July 31, 1915, was \$1,751,000,000; industrials owned abroad on that date were estimated \$518,300,000 par value. His inquiry showed that \$480,892,000 par value of these railway securities were sold in America in five months; it was known that during this same period \$140,000,000 par value of industrial securities were also exchanged. On this basis it was estimated that during the year more than \$1,000,000,000 of stocks and bonds previously held abroad were bought by American investors. The remarkable financial strength of the country made possible not merely the repurchase of these securities, but also the extension of credits aggregating \$1,000,000,000, besides which gold imports exceeded exports by over \$425,000,000.

SECURITIES. According to the *Journal of Commerce* the total authorized capital of all companies incorporated in the United States in 1915 with a capital of \$100,000 amounted to \$2,061,000,000, an increase of over 30 per cent compared with 1914. For companies with a capital of \$1,000,000 or more incorporated in the Eastern States this paper reported an aggregate of \$1,426,000,000. This amount compared with \$894,947,000 in 1914, and \$1,534,000,000 in 1913.

The actual issues of securities by railroads in 1915 aggregated \$780,216,000. Of this \$541,350,000 were bonds, \$216,515,000 notes, and \$22,350,000 stocks. Industrial companies issued a total of \$655,134,000, including \$241,838,000 bonds; \$110,918,000 notes, and \$302,377,000 stocks. Moreover, the *Daily Bond Buyer* reported during 1915, 5181 issues of long-term State and municipal bonds aggregating \$482,220,000, the largest amount of such securities ever issued in one year.

BANK CLEARINGS. The bank clearings for 137 cities reached the enormous sum of \$186,079,731,000, an amount never before equaled, and exceeding the previous maximum in 1912 by 7.8 per cent. During the first quarter the clearings aggregated \$38,915,000,000; second quarter, \$43,427,000,000; third quarter, \$44,271,000,000; fourth quarter, \$59,466,000,000. For the month of December the total was \$20,167,000,000, or .5 per cent more than in October or

November, in either of which the clearings exceeded those of any previous month in American history. By geographical divisions the clearings for the year were as follows: New England, \$8,838,236,000; Middle, \$23,939,698,000; Western, \$7,189,399,000; Northwestern, \$21,678,344,000; Southwestern, \$9,926,078,000; Southern, \$6,865,044,000, and Far-Western, \$6,642,930,000. At principal centres the clearings were: Boston, \$8,256,935,000; New York, \$110,204,392,000; Philadelphia, \$8,863,633,000; Pittsburgh, \$2,666,312,000; Chicago, \$16,198,985,000; St. Louis, \$4,153,535,000; Kansas City, \$3,835,061,000; Baltimore, \$1,833,648,000; San Francisco, \$2,693,688,000; Los Angeles, \$1,048,128,000.

Canada. Bank clearings in Canada were slightly less than in 1914, amounting to \$7,653,000,000, a decrease of .4 per cent from 1914. Slightly more than one-third of all clearings were at Montreal, nearly one-fourth at Toronto, and one-fifth at Winnipeg.

FAILURES. In spite of the many indications of business prosperity, the number of commercial failures in 1915 exceeded those of any previous year. R. G. Dun & Co. reported 22,150 suspensions in 1915, with aggregate indebtedness of \$302,286,000; similar figures for 1914 were 18,280 and \$357,908,000. *Bradstreet's* reported 19,032 failures with \$283,432,000 liabilities, these figures being respectively 13.4 per cent higher and 20.7 per cent lower than in 1914. The liabilities were, moreover, 26 per cent less than in 1907 or 1893, but the number of failures had never been equaled. The business mortality was very high, but as conditions improved in various lines, failures became fewer. In the fourth quarter the number was 37 per cent less and the liabilities 50 per cent less than in the first quarter.

Likewise railway receiverships of the year were unusually numerous, the mileage under receiverships being the greatest in nearly 20 years. The total mileage was 39,905; and the par value of bonds represented \$1,678,129,000, and of stocks, \$707,603,000. The most important lines were the Chicago, Rock Island, and Pacific; the Missouri Pacific; the St. Louis and San Francisco; the Missouri, Kansas, and Texas; the Wabash; the Texas Pacific; and the Pere Marquette. It was alleged that one factor in many cases was the restrictive legislation of Southwestern States, notably Oklahoma and Texas.

Canada. Failures in Canada reached the number of 2621, a decrease of 9.1 per cent from 1914, but exceeding the number in any previous year. The liabilities aggregated \$31,989,000, an increase of 4.2 per cent over 1914, and greatly exceeding any other year.

BUILDING. According to *Bradstreet's* the building operations in 155 American cities aggregated over \$806,000,000 in 1915. This was an increase of 4.5 per cent over the total for 1914. Nevertheless, during the first seven months, the building expenditures were less in each month than in the corresponding month of 1914, except in May, when there was an increase of .3 per cent. During the last five months there was an increase each month over 1914. While the figures for the first nine months showed a decrease of 5 per cent from those of 1914, the last quarter of 1915 showed expenditures exceeding those of the last quarter

of 1914 by 53.2 per cent. See also BUILDING OPERATIONS.

AMERICAN INTERNATIONAL CORPORATION. This organization was incorporated in New York about December 1, under the direction of the National City Bank. It was capitalized at \$50,000,000. Its purpose was to develop American trade with foreign countries, promote the investment of American capital in industrial projects in foreign lands, and develop markets abroad for American goods. The charter of the company empowered it to deal in securities, acquire concessions, make explorations, develop mines, smelt ores, build houses and factories, construct telephone and telegraph lines, wharves, and reservoirs, and indeed to do whatever was necessary in carrying on legitimate business. Among its directors were Frank A. Vanderlip, president of the National City Bank; Otto H. Kahn, of Kuhn, Loeb and Company; J. Ogden Armour of Chicago; James J. Hill, of the Great Northern Company; William E. Corey, of the Midvale Steel Company; and many other well-known financiers and industrial promoters. This corporation was formed under the leadership of the National City Bank which was carrying out a policy of establishing branches in principal South American cities, and which had acquired control of the International Banking Corporation with its 16 banks in China, Japan, India, the Philippines, Panama, and elsewhere.

FOREIGN CREDITS. One of the most unique and remarkable features of the financial history of the year was numerous and large foreign loans or credits floated in this country. It was estimated that their total exceeded \$1,000,000,000, and that about 80 per cent of the proceeds were expended in this country for war supplies of all kinds. The Canadian government secured a 5 per cent loan amounting to \$45,000,000, while 8 Canadian Provinces and 10 Canadian cities borrowed a total of \$102,000,000. Various Latin-American countries secured a total of \$50,000,000, of which Argentina secured \$15,000,000 on notes and \$31,000,000 on treasury bonds. Small loans or credits to various European countries were as follows: Switzerland, \$15,000,000; Sweden, \$5,000,000; Norway, \$8,000,000; Greece, \$7,000,000. German treasury notes to the amount of \$10,000,000 were sold in the United States. Russia, which placed orders for war supplies amounting to \$70,000,000 in the single month of October, and had previously placed orders estimated as equally great, secured one loan of \$32,000,000, and late in December was negotiating a second loan of \$60,000,000 to run for 90 days, but renewable up to 18 months. According to announcement this new loan would bear 5 per cent and 1 additional per cent for each 90 days' extension. Italy secured \$25,000,000 on one year 6 per cent notes convertible at maturity into 6 per cent one year bonds; these latter were in turn exchangeable for 10 year 5½ per cent bonds. In addition to the Anglo-French loan noted below, France secured \$75,000,000 on notes, bonds, and collateral; and London banks \$50,000,000 for six months. At the close of the year plans were under way also for additional credits for both France and Great Britain, to be based on American securities mobilized by the bank of England and the bank of France.

ANGLO-FRENCH LOAN. The most notable for-



RUFUS ISAACS (LORD READING)
Head of Anglo-French Loan Commission



Photograph by Paul Thompson
KARL HELFFERICH
Minister of Finance, Germany



Photograph by Paul Thompson
ALEXANDRE RIBOT
Minister of Finance, France



REGINALD McKENNA
Chancellor of the Exchequer, Great Britain

FOUR FINANCIERS OF THE GREAT WAR

eign loan ever floated was that negotiated by England and France. Various small credits and gold imports of more than \$150,000,000 had not prevented sterling exchange at New York from falling to about \$4.50; normally it is \$4.86, and in August, 1914, it had been nearly \$5. In September, a commission of British and French financiers, including Baron Reading, Lord Chief Justice of England, as chairman, and noted English and French bankers and publicists, came to the United States to negotiate a loan through prominent American bankers. It was stated that their original desire was to establish a credit for \$750,000,000 or even \$1,000,000,000, but after various conferences led on the part of American financiers by J. P. Morgan and Company, the sum of \$500,000,000 was fixed upon. An extensive underwriting syndicate was formed in which banks from all parts of the country participated, though some banks in various sections refused to join. Refusal was due in part to financial reasons and in part to sentiment. A vigorous effort was made by some of the leading German-Americans to prevent the participation of banks, especially savings banks, in the loan; and this was accompanied by proposals for the establishment of German-American banks in New York and Chicago. The American Truth Society formed by Germans in this country held meetings in 35 cities in opposition to the loan; it later issued a list of 56 banks taking part in the loan which were "not to be forgotten nor forgiven." The loan was taken by the syndicate at 96 or on a basis to yield an average $5\frac{1}{4}$ per cent and sold to investors at 98 or so as to yield for the 5-year period during which the securities run, about $5\frac{1}{2}$ per cent. The privilege of converting these securities into $4\frac{1}{2}$ per cent bonds running from 15 to 25 years was included. The subscription list was closed early in October, and a total was exceeded by some \$50,000,000. The largest individual subscription was \$35,000,000; there was one of \$20,000,000; one of \$15,000,000; and three of \$10,000,000 each. The first installment of 25 per cent was due October 15; a second installment of 25 per cent was due November 15; and a final installment of 50 per cent was due December 15. The loan had momentous consequences in preventing the breakdown of European exchange. It thus made it possible for England and France to continue their purchases of war supplies in the United States, a condition which reacted powerfully upon the condition of American manufactures.

FEDERAL REVENUE. The great decline in import duties which had made necessary emergency taxes in 1914 continued to be a cause of anxiety to treasury officials during 1915. It became evident early in the year that existing legislation would probably produce only barely sufficient revenue to carry the government's finances to the close of the calendar year. Moreover, when it became evident that the Administration was determined to enter upon a policy of greatly increased expenditures for the army and navy, it was perfectly certain that new sources of revenue would need to be devised. This additional revenue could be secured from an expansion of existing taxes or from new taxes, or from the sale of bonds. Either policy was evidently fraught with political dangers and economic difficulties. It was generally agreed that the income tax, which in

the fiscal year 1915 yielded only \$40,000,000, was capable of yielding a much larger return; also that a Federal inheritance tax was also likely to prove a fruitful source of revenue. Early in December Secretary of the Treasury McAdoo suggested that the emergency revenue law which would expire on December 31st be reenacted; that the law providing that sugar should be free of duty after May 1, 1916, be repealed; that the income tax rate be raised; that the exemption limit of the income tax be lowered from \$4000 to \$3000 for married men, and from \$3000 to \$2000 for single men; that the income surtax begin at \$10,000 or \$15,000 instead of \$20,000; and that taxes be imposed on gasoline, crude or refined oil, and on automobiles and other internal combustion engines according to horse power. Members of Congress proposed taxes on the profits of the manufacture of munitions; or an increase of the taxes on whiskey and beer.

Most of the proposals of Secretary McAdoo's programme above outlined were approved by the Administration. In December a caucus of House Democrats voted in favor of extending for one year the emergency tax law. On the 16th a joint resolution to this effect passed the House by a vote of 205 to 189, all Republicans and 5 Democrats voting in the negative. In the Senate the resolution carried by a vote of 45 to 29. The discussion of this proposal was largely partisan in character, and brought out the opposed policies of the two parties regarding the protective tariff.

ENGLAND. The most conspicuous feature of English financial history of the year was the prodigious efforts of the government to finance the war. The direct cost of the war to Great Britain up to the close of 1915 was estimated at \$8,000,000,000, of which some \$6,500,000,000 represented the cost during 1915. This had been met for the most part by loans, but also in part by taxation. In addition to previous taxes, over \$1,000,000,000 was raised by new taxes; and at the close of the year further taxes were in contemplation. The stock exchange at London, which had been closed in August, 1914, was reopened in January. The valuation of 387 representative British stocks by the *Bankers' Magazine* showed a decline in the aggregate market value of these stocks of \$900,000,000 in the latter days of July, 1914; of nearly \$350,000,000 more between August 1 and February 1; and of over \$700,000,000 additional decline between Feb. 1 and Dec. 1, 1915. This shrinkage was striking evidence of the unfavorable condition of general industrial operations. The war necessitated a great shift of both labor and capital to new lines of production (see UNEMPLOYMENT). The foreign trade of England showed an excess of imports in each month of 1915 over the corresponding month of 1914, with the exception of January, in which the imports of the two years were practically the same. On the contrary, the exports were smaller in each month than in the preceding year. The total imports of the year exceeded \$4,270,000,000, as compared with \$3,500,000,000 in 1914. The total exports amounted to \$1,925,000,000, as compared with \$2,180,000,000 in 1914. The tremendous financial strength of Great Britain was revealed by the fact that she had extended credit to her allies in large amounts, had exported gold to the amount of \$400,000,000, and

yet in spite of a most unusual unfavorable trade balance, had suffered a loss of only \$100,000,000 net in her gold holdings: this was owing largely to the inflow of gold from South Africa and Australia.

FRANCE. The war almost completely interrupted the foreign trade of France. It was estimated that from the beginning of the war, France had produced from her own agriculture and manufactures five-sixths of all her supplies. The Paris Bourse was reopened late in the year, and the curb market resumed partial activity. Also toward the end of the year the liquidation of accounts suspended since July, 1914, was resumed. From August, 1914, to November, 1915, the government paid out \$5,200,000,000. Of this sum \$1,000,000,000 was secured from regular taxes previously imposed; no new war taxes were enacted, though a revision of the income tax became effective Jan. 1, 1916. The bank of France had, up to Nov. 1, 1915, advanced \$1,400,000,000 to the government. Moreover, this bank held gold slightly in excess of \$1,000,000,000 at the close of the year, although it had sent \$140,000,000 gold to England, \$40,000,000 to the United States, and an equal amount to Italy and Greece; moreover, its gold reserve at the outbreak of the war was only \$615,000,000. During the latter half of 1915 an especial effort was made by the government to accumulate the gold hordes of the French people, with the result that from July 1 to December 1, \$250,000,000 in gold was sent in. Perhaps the most notable event of the year was the flotation of the "Loan of Victory" in the closing months. The total subscriptions to this were not known at the close of the year, but they approximated \$2,900,000,000 from all classes of the population. Payments were made to a considerable amount in gold, and the amount paid in exceeded that due.

GERMANY. In Germany the year brought no considerable changes in industry. The Boerse operated unofficially during the greater part of the year. Statistics as to foreign trade were lacking, though it was known that the overseas trade was almost eliminated. It was stated that the Boerse had reflected the prosperity of industries engaged in the manufacture of war supplies in that a real boom of war shares occurred during the summer; with excessive speculation. It was claimed that the prosperity of the country was evidenced by the increase of deposits in savings banks. At the outbreak of the war these banks held aggregate deposits of nearly \$5,000,000,000. Up to June 3, 1915, the new deposits were estimated at \$500,000,000; and it was estimated that the total increase in savings deposits from the outbreak of the war to the close of 1915 was \$750,000,000. The most striking financial events were the war loans.

881,000,000. There were 2,113,000 subscribers to the March loan, and 2,884,000 to the September loan. Over 90 per cent of the latter loan had been paid in at the close of the year, although only 75 per cent was due.

FINLAND. A grand duchy of the Russian Empire situated on the Gulf of Bothnia. Capital, Helsingfors.

AREA AND POPULATION. Area in square kilometers and population by governments, Dec. 31, 1910, follow:

	Sq. km.	Pop.
Nyland	11,872	376,218
Abo-Bjorneborg	24,171	499,882
Tavastehus	21,584	342,321
Viborg	43,055	521,469
St. Michel	22,840	198,829
Kuopio	42,780	388,777
Wasa	41,711	514,940
Uleaborg	165,641	328,811
Total	373,604*	3,115,197

* Of which, 47,829 sq. kilometers internal waters.

The total area in square kilometers is equivalent to 144,249 square miles. The population was 33 per square kilometer in Nyland (greatest density), and 2 in Uleaborg (the least), and the average density for the country was 9. Evangelicals numbered 3,057,627, Greek Orthodox, 52,004, Baptists, 4467, Methodists, 676, Roman Catholics, 423. Speaking Finnish as their native tongue were 2,565,742, Swedish 344,364, Russian 7339, German 1794, Lapp 1660, other tongues 298. Total population as estimated Jan. 1, 1913, 3,196,700; 1911, 3,154,824. Of the 2,712,562 adults listed as actively pursuing occupations, 1,555,357 were engaged in agriculture. Helsingfors had 161,091 inhabitants in 1912, Abo 52,057, Viborg 28,257, Tammerfors 46,192, Nikolafstad 23,275, Björneborg 17,072, Uleaborg 21,271, Kuopio 16,266.

Education is on a much higher plane than in Russia. Primary instruction is free and compulsory between the ages of 7 and 15. Secondary schools are well attended, and special schools of agriculture are maintained, devoting particular attention to stock raising and dairying.

PRODUCTION AND COMMERCE. Cereal crops are grown; also roots and forage plants. The timber industry is important. Iron ore is mined, and pig and bar iron are produced for export. In 1912 the harvest yielded 42,283 hectolitres of wheat, 3,656,630 of rye, 1,795,000 of barley, 7,416,030 of oats, 6,630,110 of potatoes. Revenue from crown forests in 1913, 13,517,512 marks; expenditure, 3,283,960.

The trade by countries of origin and destination, with values in thousands of marks (gold), is shown below for three years:

	Imports		Exports	
	1911	1912	1911	1912
Germany	173,400	186,767	202,585	46,500
Russia	137,500	131,676	140,198	89,000
United Kingdom	61,700	68,335	60,660	88,100
Denmark	23,071	26,087	28,094	11,700
Sweden and Norway	21,600	25,218	29,358	14,500
France	6,400	7,437	7,113	11,653
Spain	2,200	2,286	2,692	27,100
Other	18,587	22,289	24,789	8,700
Total	444,500	420,082	495,434	319,600
				370,040
				404,799

The subscriptions to a loan in March totaled \$2,167,000,000; and to that of September, \$2,-

The principal articles of export are timber, paper and pulp, butter, hides and leather,

wooden wares, fish, cotton textiles, iron. Vessels entered (1913), 11,901, of 3,696,330 tons; cleared, 11,937, of 3,628,905. Merchant marine (Jan. 1, 1913), 3547 vessels, of 408,660 tons (507 steamers, of 71,297).

COMMUNICATIONS. Railways in operation Jan. 1, 1913, 3763 kilometers. At the beginning of 1914 the total mileage of the Finnish State Railways, including 207 miles of line owned by private capital, but operated by the state lines, was 2537. Finland has 2765 miles of navigable waterways, of which, with the existing facilities, it was estimated that the freight capacity is about 1,600,000 tons a year. The waterways, as well as the railways, are under the administration of the state. The Russian government has decreed that all new lines are to be constructed in conformity with Russian lines, that existing lines are to be so altered as to permit the use on them of Russian rolling stock. With the completion of the Kaskö-Kristinestad line will be begun extensions of present lines to form a continuous route from Nikolaiestad to Petrograd. The projected alterations and extensions were decided upon, not by the Diet of Finland, but by Russia; though the Finnish railways are for the most part owned by the Finnish government.

FINANCE. The revenue for the year 1913 (figures are from an English source) amounted to £6,796,715 ordinary and £20,610 extraordinary (£22,050 from funds); of which £3,004,905 was derived from state domains and forests, railways, canals, etc.; £2,709,666 from indirect taxes (customs and excise), £244,860 from direct taxes, etc. Expenditure, £5,953,867 ordinary and £956,442 extraordinary (£22,281 for funds); of which £1,917,015 for communications, £785,411 for worship and instruction, £574,122 for civil administration, £531,882 military contribution, £301,019 debt charge, £292,864 for agriculture, etc., £281,156 for commerce and industry, etc. The military contribution goes into the Russian treasury. The debt stood Jan. 1, 1914, at £6,485,352.

GOVERNMENT. Until the present régime Finland enjoyed the autonomy guaranteed her in the reign of Alexander I. Latterly the Russification system has been applied to an increasing number of departments, until the schools, the press, the law, and the legislature have all been invaded. By the end of 1912 the constitution was virtually annulled. The Diet (200 members) elected by universal suffrage for three years, formerly possessed of large powers in civil administration, has latterly been little more than a figurehead. The Russian sovereign is the grand duke. There is a resident governor-general, and a secretary of state residing at Petrograd.

FINLAY, CHARLES JOHN. Cuban scientist and biologist, died Aug. 20, 1915. He was born in Cuba in 1833, and received his education in France, and at the Jefferson Medical College, Philadelphia, from which he graduated in 1855. He took up practice in Cuba, and in 1881 made the discovery that the mosquito was a disease spreader. This theory was at first received with ridicule, but Dr. Finlay continued his experiments, and in the last-named year his theory was established by tests in the transmission, through the bites of mosquitoes, of yellow fever. Five years later his discovery received atten-

tion from medical journals, and gradually came to be accepted. In 1899 the United States Army Commission proved the correctness of the theory through the work of Major Reed, Dr. Lazear, and their associates. These men took Dr. Finlay's data as a basis for their investigation. Dr. Finlay was chief sanitary officer of Cuba from 1902-08. He belonged to many medical associations in Cuba, and in other countries.

FIRE INSURANCE. See **INSURANCE.**

FIRE PREVENTION. See **FIRE PROTECTION.**

FIRE PROTECTION. Increased attention was being paid to methods of fire prevention as distinct from fire fighting in many fire departments throughout the United States during 1915. This involved more inspection by members of the uniformed force, the formulation and enforcement of new regulations, and the arousing of public sentiment to realize disadvantageous conditions where they existed. This side of the matter had been too much neglected in American fire departments in the past, and it was to be hoped that fire department efficiency would be regarded on the basis of the small number of fires rather than on the number of fires occurring and extinguished with small loss. But the movement was not confined exclusively to fire departments. Better statutes were being passed to afford increased protection and to punish neglect and carelessness; better building construction was being secured through improved building codes and otherwise (see **BUILDING OPERATIONS**), and in general a more enlightened public sentiment was supporting legislators and officials in their plain duties, not to mention increased attention to proper fire protection by factory owners as well as individuals in their homes and other buildings.

LIABILITY FOR FIRES. An interesting and noteworthy development in American fire protection is the assessing of damages due to fire on the owner of premises where a fire originates through neglect, carelessness, or violation of rules and regulations. A law, signed by Governor Brumbaugh of Pennsylvania on May 6th, applied this principle to cities of the second class in that State. The essence of the law was as follows:

Where a fire originates on the premises occupied by any person, firm, or corporation as a result of his or its criminal intent, design, or wilful negligence, or where said person, firm, or corporation has failed to comply with any law or ordinance made for the prevention of fire or the spreading thereof, such person, firm, or corporation shall be liable in a civil action to the city for the payment of all costs and expenses of the fire departments incurred in the extinguishment of or any attempt to extinguish any fire originating as aforesaid. The amount of such costs and expenses shall be based upon the wages of the firemen and other officers for the time they were engaged, a reasonable amount as rental for the use of the apparatus and the cost of the water and other materials used, with an additional amount of 10 per cent on the total amount as overhead charges.

In 1915 there was a general improvement to be noted in fire-fighting facilities due largely to the general acquisition of motor apparatus; and in part, as a result, the number of fires

quenched soon after their incipency was increased, particularly in the smaller towns. The appreciation of proper equipment was thus being brought home to city authorities. An interesting development in the way of apparatus for small fire departments was a chemical engine carried on an ordinary Ford car. This was equipped with two 25-gallon chemical tanks, 150 feet of $\frac{3}{4}$ -inch chemical hose and a nozzle, two special fire department extinguishers, lanterns, rope, axes, and other appliances. Various types of motorcycles and tricarcs were also equipped with fire extinguishers, and even in the smallest villages a tendency was manifested of having available at least some simple apparatus and one or more men who understood its use to send out in case of fire.

In New York City in 1915 there were 1004 fewer fires than in 1914, with a reduction also in the average loss. This was due to the various fire prevention methods which had been enforced by the Fire Department, including better housekeeping, better construction, better fire-proofing of shafts and stairways and other openings, better inspection, and increased supervision by fire department officials. The work in fire prevention was securing results, and it was believed that the city was in better shape to resist fire than ever previously.

AMERICAN FIRE LOSSES IN 1915. The losses by fire in the United States and Canada during 1915, as recorded by *The Journal of Commerce and Commercial Bulletin* (New York), aggregated \$182,836,200, or a decrease of \$52,755,100 from the figures of the year 1914, which were \$235,591,350. The fire loss record for 1915 was the smallest since 1905, when the figures recorded were \$175,193,800. This decrease of fire losses was considered a most encouraging sign and seemed to show that the various campaigns for fire prevention and protection had not been without results.

There were no serious conflagrations during the year, and while some 28 fires resulted in an estimated property damage of \$500,000 or over, only one amounted to more than \$2,000,000. The fires of \$500,000 or over during the year were the following:

Location—Description	Estimated damage
Philadelphia, Pa., lumber yards and other...	\$500,000
Bayonne, N. J., lumber yards and other...	800,000
Trenton, N. J., wire rope works.....	1,000,000
Detroit, Mich., office building.....	700,000
Warrensburg, Mo., school building.....	500,000
Champaign, Ill., business district.....	500,000
Spokane, Wash., business block, etc.....	500,000
Poughkeepsie, N. Y., oil works.....	500,000
Russellville, Ala., business section of town...	500,000
Fresno, Cal., winery.....	500,000
Oswego, N. Y., match factory and lumber...	600,000
Newport News, Va., grain elevator and other...	2,000,000
Los Angeles, Cal., grocery warehouse.....	1,000,000
Chicago, Ill., furniture factory, church and other.....	500,000
Ardmore, Okla., business section.....	500,000
Marshall, Tex., railroad shops.....	700,000
Richmond, Va., tobacco warehouse.....	500,000
Seattle, Wash., steamship pier.....	500,000
Augusta, Ga., cotton compress and cotton...	500,000
Clifton, Ariz., copper mine works.....	750,000
Bethlehem, Pa., ordnance works.....	1,500,000
Trenton, N. J., steel rope works.....	1,000,000
Altus, Okla., cotton and compress.....	500,000
Pine Bluff, Ark., warehouse and cotton.....	1,000,000
Alabon, Cal., half business portion of town...	1,000,000
Hopewell, Va., almost whole town.....	1,100,000
Erie, Pa., grain elevators.....	1,000,000
Chicago, Ill., linseed oil plant.....	2,000,000

During the 39 years ended 1915 the fire losses for the United States and Canada had attained the stupendous total of \$6,049,817,225, or an average annual loss of \$155,122,518. The following tabulation shows the losses by years and emphasizes the improved record for 1915:

FIRE LOSSES DURING PAST THIRTY-NINE YEARS AGGREGATE \$6,049,817,225		
1915.....	\$182,836,200	1895.....\$129,835,700
1914.....	235,591,350	1894.....128,246,400
1913.....	224,728,350	1893.....156,445,875
1912.....	225,820,900	1892.....151,516,000
1911.....	234,337,250	1891.....143,764,000
1910.....	234,470,650	1890.....108,893,700
1909.....	203,649,200	1889.....123,046,800
1908.....	238,562,250	1888.....110,885,600
1907.....	215,671,250	1887.....120,283,000
1906.....	459,710,000	1886.....104,924,700
1905.....	175,193,800	1885.....102,818,700
1904.....	252,554,050	1884.....110,008,600
1903.....	156,195,700	1883.....110,149,000
1902.....	149,260,850	1882.....84,505,000
1901.....	164,347,450	1881.....81,280,000
1900.....	163,362,250	1880.....74,643,400
1899.....	136,773,200	1879.....77,703,700
1898.....	119,650,500	1878.....34,315,900
1897.....	110,319,650	1877.....68,265,800
1896.....	115,653,500	
Total for thirty-nine years.....\$6,049,817,225		

During the year the engineers of the National Board of Fire Underwriters worked out a proposed scheme of relative values for fire defenses and physical conditions of the various towns and cities. This scheme was adopted tentatively by the Actuarial Bureau with the consent and approval of the Executive Committee of the National Board, and was of interest as showing the various factors to be considered in reaching an estimate of the facilities for resisting fire possessed by a community. The table is based on a maximum of 5000 points, and the relative values are as follows:

Relative Values (Maximum 5,000)	
Water supply.....	1,700
Fire department.....	1,400
Fire alarm.....	550
Police.....	50
Building laws.....	200
Explosives and inflammables.....	200
Electricity.....	150
Natural and structural conditions.....	750
	5,000

Working on the above scheme it was proposed to classify the various towns and cities according to their merit. The first class would be cities and towns where the deficiency from the above maximum did not exceed 500 points; second, 500 to 1000; third, 1001 to 1500; fourth, 1501 to 2000; fifth, 2001 to 2500; sixth, 2501 to 3000; seventh, 3001 to 3500; eighth, 3501 to 4000; ninth, 4001 to 4500; and the tenth representing a deficiency of 4501 to a condition without fire protection at all. The scheme was worked up in detail, and the various elements of apparatus, water distribution systems, etc., were all considered.

During the year there was an extension of high pressure systems, and of this form of protection. This subject was taken up in a paper on "Fire Protection" read at the International Engineering Congress by John R. Freeman, and in the discussion it was stated that high pressure systems are only available where there is a large and properly trained department. Nevertheless, the construction and extension of such systems were in progress, and Cincinnati,

Ohio, was installing for a congested area district a system surrounded by a 20-inch ring main, with two 16-inch cross mains, with 12-inch lines grid-ironing the district, with four valves at each crossing, and three at each T, so that any block or blocks could be cut off without interference with the supply of the others. The high pressure pumping station is located at 8th Street and Eggleston Avenue, and takes filtered water at 55 pounds pressure from three city mains, and has a capacity of 75,000,000 gallons per day. The hydrants are designed for a working pressure of 300 pounds per square inch and are tested to 600 pounds. These hydrants are set in vaults with other tubes about 4 inches below street level. The port directors of Boston approved the proposed site for a high pressure pumping station at the corner of Dorchester Avenue and Summer Street bridge. Several miles of high pressure mains were laid through the city in 1914, and a corresponding amount in 1915.

During the year a number of serious fires occurred in establishments devoted to the manufacture of various munitions of war. Thus, on November 10th, a fire at the Bethlehem Steel Company's works, Bethlehem, Pa., destroyed a machine shop with a loss estimated at \$1,500,000 or less. This was said to be due to a short circuit igniting oil in one portion of the plant. On December 9th the new city of Hopewell, Va., a town of some 500 acres, was destroyed by fire which, however, did not attack the adjacent 3200-acre plant of the Du Pont Powder Company, which had been established within a few years at this place, which is 12 miles from Petersburg. These and similar fires gave rise to a somewhat general suspicion that they were the work of incendiaries employed by European governments to harass manufacturers of war material. In few, if any, cases were such claims substantiated, and it was thought in many instances that the ex-

treme speed with which work was being done, the use of new plant and equipment, and inadequate supervision of new workers, were responsible.

Up to November, 1915, 153 school fires were reported, and the most serious of these was at Peabody, Mass., on October 28th, when St. John's Parochial School was burned, and 21 pupils perished. This fire aroused a general consideration of the construction and equipment of school buildings, and added attention was given to fire drills.

A serious fire during the year was that at the factory of the Union Paper Box Company, Pittsburgh, October 25th, when 13 girls and 1 man perished, and 20 others were seriously hurt. This was followed by a fire in Brooklyn, N. Y., at the Diamond Candy Company, Nov. 6, 1915, when 8 employees were suffocated or burned to death, and 4 jumped and were fatally injured, in addition to others injured in other ways. A fire and explosion, in which 55 lives were lost, and \$500,000 worth of property destroyed, took place at Ardmore, Okla., in August, 1915, caused by the explosion of a 250-barrel gasoline car.

There were, as usual, a number of fires during the year involving serious loss of life, but in practically every case these disasters resulted from ignoring plain warnings from earlier and similar catastrophes. Fire engineering and building construction, not to mention plans for the safety of the occupants, had long since reached a stage where the precautions to be observed were clearly indicated and where these were not enforced the responsibility lay with the community rather than with engineers or experts. See also FORESTRY.

STATISTICS OF FIRES. The National Board of Fire Underwriters, through its Committee on Statistics and Origin of Fires, published its usual tables for the leading European and American cities, from which the accompanying information has been compiled.

STATISTICS OF FIRES IN AMERICAN CITIES, 1914

	Area Sq. Mile	Population	No. of Alarms	Total No. of Fires	Confined to Building or Place of Origin	Total Loss	No. of Fires per 1000 Popu- lation	Loss per Capita
New York	314.75	5,698,667	16,245	14,425	14,128	\$8,217,811	2.53	\$1.44
Chicago	194.4	2,450,000	14,977	12,447	11,944	6,018,589	5.08	2.46
Philadelphia	129.5	1,660,000	5,061	4,383	4,240	2,791,130	2.64	1.68
St. Louis	61.37	790,000	4,674	3,808	3,011	2,900,522	4.19	3.42
Boston	47.85	750,000	5,679	4,249	4,221	3,044,627	5.67	4.06
Cleveland	57	660,000	3,096	2,879	...	1,756,863	4.36	2.66
Baltimore	38.67	600,000	2,860	2,261	2,235	704,138	3.77	1.77
Pittsburgh	40.67	565,000	2,160	2,016	1,986	1,750,437	3.57	3.10
Detroit	42	560,000	3,602	3,160	...	1,675,261	5.64	2.99
Buffalo	42	460,000	2,279	2,151	2,140	1,167,996	4.68	2.54
San Francisco	38.87	450,000	2,645	2,451	2,314	1,037,486	5.44	2.80
Cincinnati	70.8	402,000	2,217	2,138	...	699,473	5.32	1.74
Newark, N. J.	23.5	400,000	1,913	1,159	1,081	1,280,110	2.90	3.20
New Orleans	196.25	360,000	889	868	811	935,614	2.41	2.60
Washington, D. C.	70	353,378	1,374	1,301	1,231	779,792	3.68	2.21
Los Angeles	121.25	450,000	2,573	2,243	2,163	1,070,570	4.98	2.38

COMPARATIVE FIRE LOSSES

	Number of Cities Reporting Loss					Population		Per Capita Loss				
	1911	1912	1913	1914	1911	1912	1913	1914	1911	1912	1913	1914
United States	298	300	298	298	81,210,084	32,326,633	33,281,804	40,213,230	2.62	2.55	2.25	2.82
Argentina	..	1	1	..	..	1,428,042	1,428,042	..	..	8.58	4.21	..
Austria	1	4	4	1	2,081,498	2,658,078	2,734,936	157,000	.08	.30	.25	.42
Belgium	..	1	1	..	..	166,445	168,812	..	..	.69	1.86	..
Canada	1	5	6	6	125,000	957,372	612,453	597,709	2.61	2.88	2.46	8.58
Chile	..	..	1	..	..	..	200,000	..	..	..	.30	..
England	12	12	14	9	9,898,317	7,164,849	7,396,664	6,916,651	.53	.54	.33	.67
France	3	6	5	8	3,518,493	4,425,696	3,945,743	3,659,224	.81	.84	.49	.63
Germany	8	9	8	4	2,306,854	2,659,575	2,559,608	836,007	.21	.20	.28	.17
Hawaii	..	..	1	..	..	..	45,000	..	..	..	.69	..
Ireland	2	2	2	2	694,272	699,808	701,400	700,000	.58	.57	.28	.39
Italy	6	3	5	5	1,873,995	282,082	1,161,465	1,189,458	.81	.90	.25	.37
Japan	..	..	8	10	..	..	2,481,528	5,611,983	..	..	.59	.44

COMPARATIVE FIRE LOSSES

	Number of Cities Reporting Loss				Population		Per Capita Loss			
	1911	1912	1913	1914	1911	1912	1911	1912	1913	1914
Norway	1	1	1	.....	250,000	250,400	251,000	...	.69	.32 .48
Philippine Islands.....	1	1	1	.....	.....	234,409	284,409	...	...	4.41 1.28
Russia	2	2	2	1 8,483,291	8,485,583	8,710,000	1,617,157	1.17	.84	.89 1.19
Scotland	2	2	3	1 484,190	485,091	1,516,905	168,891	.56	.49	.36 5.85
South Africa	1	1	1	.....	.....	50,000	.....	.....	.....	1.77
Spain	1	1	1	.....	.....	605,870	606,150	.....	.....	2.80 .15
Sweden	1	1	1	.....	351,500	388,000	886,211	...	.18	.74 .54
Switzerland	1	1	1	.....	140,000	142,000	145,000	...	.04	.15 .19
The Netherlands	2	1	1	.....	417,698	801,846	812,424	...	.12	.11 .07

UNITED STATES				Population	Total Loss	Per Capita
1911—Whole country	98,927,000	*217,004,575	2.81			
298 cities	81,210,084	† 81,790,877	2.62			
1912—Whole country	95,410,503	*206,488,900	2.16			
800 cities	82,326,633	† 82,297,886	2.55			
1913—Whole country	97,163,380	*203,763,550	2.10			
298 cities	83,281,804	† 74,876,608	2.25			
1914—Whole country	98,781,324	*221,439,850	2.24			
298 cities	40,218,230	† 98,368,795	2.82			

* Estimated. † Actual figures reported.

STATISTICS OF FIRES IN GREAT CITIES OF THE WORLD OUTSIDE OF THE UNITED STATES, 1914

Place	Area Sq. M.	Popula- tion	No. of Alarms	Total No. Fires	Confined to Build- ing or Place of Origin	Total Loss	No. of Fires to 1000 Pop.	Loss per Capita	Loss per Fire
Australia— Melbourne	280	642,210	2,808	1,295	1,214	.....	2.02	...	....
Austria— Graz	8.85	157,000	120	89	89	\$6,576	.57	.42	\$ 74
Canada— Halifax .....	.....	47,000	270	270	.....	316,200	5.74	6.73	1.171
Hamilton	11.44	101,344	433	175	156	312,317	1.73	3.08	1,785
London	10	55,865	264	208	208	200,458	3.76	3.62	964
St. John	2.5	60,000	247	225	224	140,000	3.75	2.38	622
Vancouver	16.89	124,000	642	244	234	677,771	1.97	5.47	2,778
Winnipeg	24.5	210,000	345	192	.....	491,218	.91	2.84	2,558
Denmark— Copenhagen	27.13	485,500	642	476	470	.....	.98	.....	....
England— Birkenhead	6.16	137,996	148	145	143	155,250	1.05	1.18	1,071
Birmingham	68.12	840,202	1,042	827	802	1,051,580	.98	1.25	1,272
Bolton	23.87	188,879	63	57	55	175,745	.29	.98	3,088
Bradford	35.7	291,177	186	159	159	.....	.55	...	....
Cardiff	12.6	182,280	168	164	162	99,770	.90	.55	608
Lancaster	10	41,414	12	12	.....	1,490	.29	.04	124
Leeds	41	450,000	298	292	287	877,080	.65	.84	1,291
London	117	4,516,612	6,125	3,600	.....	2,750,000	.80	.60	765
Sheffield	88	476,971	382	349	349	110,950	.73	.28	318
York	5.76	82,297	85	35	35	6,740	.43	.08	198
France— Bordeaux	13.62	261,738	391	146	135	158,958	.56	.61	1,088
Marseilles	88.7	550,500	500	482	475	433,528	.88	.79	899
Paris	80.11	2,846,986	4,366	3,654	.....	1,780,948	1.28	.61	477
Germany— Aachen	68.38	160,000	299	260	260	31,646	1.62	.20	122
Berlin	24.5	2,082,111	2,469	1,858	1,841	.....	.89	...	....
Dresden	27.9	553,880	519	371	371	.....	.67	...	....
Flensburg	17.02	66,506	99	89	89	12,668	1.34	.19	142
Frankfurt A/M.	52.01	444,500	334	273	269	71,189	.61	.16	261
Posen	18.1	165,000	370	229	229	28,482	1.39	.17	124
Ireland— Belfast	25.8	390,000	164	164	.....	181,385	.45	.46	1,106
Dublin	12.4	810,000	251	164	.....	78,250	.53	.22	477
Italy— Brescia	24.	86,000	134	122	.....	21,146	1.42	.25	174
Florence .....	.....	238,800	193	174	.....	40,132	.73	.17	231
Messina .....	.....	127,689	142	101	100	40,986	.79	.82	405
Milan .....	.....	660,969	988	786	786	320,104	1.19	.48	407
Ravenna .....	.....	76,000	22	21	21	17,980	.28	.24	856
Japan— Hukuoka	2.5	95,742	16	16	10	9,046	.17	.09	565
Kakodate	16	100,773	77	77	9	854,095	.76	3.50	4,329
Kanazawa	8.8	127,267	22	22	5	12,635	.17	.10	514
Kobe	14.5	440,766	156	156	128	165,037	.35	.37	1,053
Kyoto	13.5	508,068	110	88	72	293,740	.17	.58	8,383
Nagasaki	6.1	165,000	6	6	4	13,058	.04	.08	2,176
Nagoya	15.7	447,951	104	87	78	345,182	.19	.77	3,968
Osaka	22.5	1,331,994	203	198	148	373,623	.15	.28	1,887
Tokio	80	2,008,321	521	437	337	684,346	.22	.34	1,568
Yokohama	12	391,101	116	116	99	252,264	.30	.65	2,261
Norway— Christiana	6.3	251,000	388	321	297	121,386	1.27	.48	378
Philippine Islands— Manila	14.9	234,409	134	121	111	299,618	.58	1.28	2,475

STATISTICS OF FIRES IN GREAT CITIES OF THE WORLD OUTSIDE OF THE UNITED STATES, 1914.

Place	Area Sq. M.	Popula- tion	No. of Alarms	Total No. Fires	Confined to Build- ing or Place of Origin	Total Loss	No. of Fires to 1000 Pop.	Loss per Capita	Loss per Fire
Russia— Moscow	85.8	1,617,157	1,228	1,183	1,123	1,926,525	.78	1.19	1,629
Scotland— Aberdeen	10.5	168,891	198	164	161	876,215	1.00	5.35	5,848
South Africa— Kimberley	10	50,000	115	42	42	89,840	.84	1.77	2,127
Spain— Madrid .....	.....	606,150	820	770	650	92,000	1.27	.15	119
Sweden— Stockholm	46.87	886,211	785	781	729	206,752	1.89	.54	288
Switzerland— Basle	14.82	145,000	91	86	86	27,993	.59	.19	328
The Netherlands— Amsterdam	18	609,000	1,866	1,117	1,116	.....	1.88	...	....
The Hague	16.1	312,424	684	303	801	21,240	.97	.07	70

FISH AND FISHERIES. The last available report of the United States Commissioner of Fish and Fisheries gave statistics up to June 30, 1914. According to this report the amount and value of fish landed at Boston and Gloucester for the year were as follows:

	Amount in lbs.	Value
Cod	44,864,813	\$1,574,875
Cusk	5,959,286	102,468
Haddock	58,672,665	1,488,356
Hake	14,085,890	291,904
Pollock	15,267,401	261,557
Halibut	5,288,154	459,804
Mackerel	5,676,002	347,068
Herring	11,747,226	218,621
Swordfish	2,380,920	198,877
Miscellaneous	3,274,879	47,487

Of this, 67.52 per cent of the quantity and 65.45 per cent of the value were taken from grounds lying directly off the United States coast. The menhaden fisheries had a value of \$2,269,912 in fish, while the finished products were valued at \$3,690,155. In North Carolina, measures have been taken to allow the spawning shad a free passage up the middle of rivers, and this has resulted in a large increase in the number of eggs taken at the hatching stations. It is expected that there will be a corresponding increase in the number of adult fish. In order to secure a greater supply of lobster eggs, arrangement has been made with Maine fishermen, by which berried lobsters will be given to the bureau in exchange for stripped females. Of recent development is the canning of the long finned tuna of California, and it was estimated that 400,000 cases would be marketed in 1914. According to a newspaper item appearing in October, the 1915 catch of mackerel was the largest on record.

For the year 1914 there was appropriated by Congress to the United States Bureau of Fisheries for salaries, \$391,180, and for the propagation of food fishes, \$350,000. The latest available statistics showed that in 1912 8400 persons were engaged in making buttons and other products from the fresh water mussels, the output being valued at \$8,882,000. The value of the shell was estimated at \$294,600, while incidentally, \$149,000 worth of pearls were collected with the shells. The Bureau is also making especial efforts to encourage the use of mussels for food. The survey work of the Bureau has shown that there are excellent black bass fisheries off the coast at Beaufort, N. C., and large scallop beds extending to within 40 miles of

New York City. The report calls attention to the fact that on many farms there are waste lands which could easily be flooded and stocked with fish, thus adding to the available food supply at comparatively little cost. During the year the Bureau distributed 530,213,575 eggs, 3,494,991,837 fry, and 22,438,005 fingerlings and adults.

The latest complete official compilation regarding Alaskan fisheries is that for the year 1914, when the total products were valued \$21,243,000, exceeding by \$5,500,000 the values for the year 1913. Of the phenomenal catch of 1914, 92 per cent pertained to the salmon alone, in which industry there was invested capital of \$31,894,000, giving employment to 21,200 persons. The 84 salmon canneries sent forth fish valued at \$18,920,000 besides miscellaneous other products than canned valued at \$638,000. The fishery products of 1915 slightly exceeded in value those of any preceding year. Dr. Hugh Smith, Chief United States Fisheries, estimates the total value at \$21,535,992, of which the salmon industry yielded \$18,844,899. Plans for the improvement of fishery conditions are in progress by the United States Bureau of Fisheries, as to hatcheries, methods of fishing, conservation of supply, waste-preventions and refuse-utilizations. Under congressional acts certain waters have been withdrawn from exploitation by fishing industries. In addition on Jan. 1, 1916, there became effective prohibition against salmon fishing in waters tributary to Barnes Lake, Prince Wales Island; Hetta Creek and tributaries; Sockeye Creek and Boca de Quadra hatchery waters. Complications as to Alaskan fisheries are threatened by the bill passed April 22, 1915, by the Alaskan Legislature imposing additional license fees on fisheries, salteries, fish-traps, etc., already taxed by the United States. The bill yet awaits approval by Congress to become a law. See also ALASKA, *Fur Seal*.

Work on economic fish problems was continued in England, though the *International Exploration of the Seas* was stopped by the war. The station at Port Erin reported that in 1914 nearly 9,000,000 plaice were hatched, and about 8,000,000 young were liberated. Out of 24,500 lobster eggs, 1823 young were reared to the fourth stage. The Board of Agriculture and Fisheries began the marking of salmon and sea trout with metal tags, afterwards turning the animals loose, in order to collect data later on their growth, migrations, and general natural history. Further evidence has been collected to demonstrate that

the age of cod can be determined by the rings on the scales and by the concentric rings of the otoliths.

Gardiner pointed out the fact that an abundance of sunshine in the spring, by favoring the growth of diatoms, and thus favoring the growth of copepods, will result in a greater abundance of food for fishes, and thus increase the number of mackerel. It might thus be possible in the spring to form an estimate as to the abundance of fish to be found later. See also ZOOLOGY.

FISHERIES. See section so entitled under various countries and States of the United States.

FISK UNIVERSITY. An institution for higher education of the colored race, founded in 1866 at Nashville, Tenn. The total enrollment in all departments in the autumn of 1915 was 512. The teaching faculty numbered 38, and the officers 13. Mr. Fayette Avery McKenzie was inaugurated president on November 9th. During the year, Dr. C. W. Morrow was appointed dean, instead of acting president; A. G. Shaw was appointed professor of physics; and H. C. Maeder professor of Latin and history. The productive funds of the university amounted at the end of the fiscal year to \$236,810, and the income from investments for that year to \$11,446. The library contained about 11,500 volumes.

FITCH, GEORGE. American writer, died Aug. 9, 1915. He was born in Galva, Ill., in 1877, and graduated from Knox College in 1897. He engaged in newspaper work on several papers in Illinois, and finally joined the staff of the Peoria *Herald-Transcript*. In this paper appeared his first humorous writings which soon gained him wide recognition. His stories of college life, written with much humor, were especially well received. His writings include: *The Big Strike at Sycash* (1909); *At Good Old Sycash* (1911); and *My Demon Motor Boat* (1912). In 1912 Mr. Fitch was elected to the Illinois House of Representatives as a Progressive. At the time of his death, he was president of the American Press Humorists' Association.

FLAX. Data pertaining to the flax crop of the world in 1915 were very incomplete, only a few countries reporting estimates of their yields. Italy reported a production of 2,968,000 bushels of seed, and 5,060,000 pounds of fibre. Holland placed its fibre crop at 10,795,000 pounds. The linseed harvest of British India amounted to a little over 17,000,000 bushels, and the Canadian harvest to 12,604,700 bushels from 1,009,600 acres, the rate of yield being 12.48 bushels per acre. The Canadian flaxseed crop of 1915 was 75 per cent greater than the crop of 1914. The United States produced 13,845,000 bushels on 1,367,000 acres, the average yield per acre being 10.1 bushels. The area was less by about 275,000 acres, but the yield was larger by nearly 100,000 bushels than in 1914. For the five-year period, 1909-13, the average area in flax was 2,490,000 acres, and the average production 19,501,000 bushels. The area devoted to fibre flax in the United States was, as usual, very limited. As pointed out by the Department of Agriculture, fibre flax has been grown with favorable results during recent years in the Puget Sound and the lower Columbia and Willamette River regions, as well as in the territory surrounding the Great Lakes and including Wisconsin, Minnesota, and the valley of the Red River of the

North. The State of Oregon appropriated money for experiments with fibre flax. An equipment for handling and working the flax was installed at the State prison and the convicts were also required to assist in harvesting the crop from the fields. Promising results were obtained and the State secured fibre flax seed of its own growing for distribution.

FLINT, AUSTIN. American alienist, died Sept. 23, 1915. He was born in Northampton, Mass., in 1836, and was educated in private schools in Buffalo, and at Harvard University, where he studied for two years. He afterwards studied medicine at the University of Louisville, and in the Jefferson Medical College, Philadelphia. In 1857 he began to practice in Buffalo, where, from 1857-59, he was also editor of the *Buffalo Medical Journal*. In 1859-59 he was professor of physiology and microscopical anatomy in the medical department of the University of Buffalo. He removed to New York in the latter year, becoming professor of physiology in New York Medical College. After a year spent in New Orleans, he was appointed acting assistant surgeon, United States army, at the General Hospital, in New York City, remaining there until 1865. From 1861 to 1898 he was professor of physiology and microscopical anatomy at the Bellevue Hospital Medical College, of which he was one of the founders. In 1898 he was appointed to the same chair at Cornell University Medical College, becoming several years before his death professor emeritus. He made a specialty of insanity, and was consulting physician in several State hospitals for the insane. His greatest fame among laymen came from his connection with the celebrated Thaw case. His testimony as to the insanity of Harry Thaw was perhaps the strongest factor in preventing the latter's release from the asylum for the criminal insane, following the murder of Stanford White. During the year 1860 he attracted attention for his operations on the spinal cord and nerves of living animals. Many honors were conferred upon him by medical and scientific societies. These included a prize from the French Academy of Science in 1862. He was interested in military matters, and in 1874 was appointed surgeon-general of New York State. He received the degree of LL.D. from Princeton University. He wrote much on medical subjects, including an elaborate revision of the history of the discovery of the motor and sensory properties of the spinal nerve roots. Among his books may be mentioned: *The Physiology of Man* (1866-75); *Text Book of Human Physiology* (1875-88); *Source of Muscular Power* (1878); and *Hand Book of Physiology* (1905).

FLOOD PREVENTION. The disastrous floods of 1913, as well as the perpetual menace to many cities in the Middle West due to the inadequate control of rivers and waterways, during the spring season, led to the consideration of a number of important engineering works. In Indianapolis about 4½ miles of levee were being built along the west bank of the White River, involving an embankment whose water slope was faced with concrete, and had at some places concrete retaining walls. This work in some cases had involved the rectification of the river channel and provided for a considerable increase in width of the channel at high water, so that several bridges would have to be lengthened to give the required waterway. This was an important con-

sideration, as the water channel under many bridges through the Western States was found to be seriously inadequate, due to encroachments on the natural width of the waterway. The top of the levee, which is to be incorporated in the boulevard system of the city, was to be a broad driveway with lawn spaces on each side, the top being from 12 to 17 feet above the original ground level, and 4 feet above the 1913 high water mark. Plans were also being prepared for similar protection along the east bank, while work had been done along Fall Creek. The work was begun in June, 1915, and was to be finished during the year. The contract price was in the neighborhood of \$460,000, and the cost of land acquired for the improvement was about \$655,000. The new work involved modern concrete construction with a well-equipped plant.

In Ohio, preliminary engineering work was completed in the Miami conservancy district, which is a territory including Dayton and Hamilton, and embracing the watershed of the Miami River and its tributaries. The reservoir originally contemplated for Logan County was considered less efficient than was at first supposed, and had to be compensated for at other sites and at a substantial saving in cost. The topographical survey of the district included some 240,000 square miles, which was begun very carefully, and some 12,000 feet of test borings on dam sites were made, so that the general character of the flood protection and prevention works could be determined. Various legal complications were in the way of the prosecution of the work, but it was to be undertaken, as well as approved by the court.

The great damage resulting from floods in the Middle West led to the discussion of many schemes of flood prevention. In view of its hydrographic and other river work, it was urged that flood-prevention on inland rivers might properly be undertaken by the Federal government in coöperation with the localities affected. A clause in the river and harbor bill passed in 1915 provided that the chief of engineers of the United States army might have examinations and surveys made "with a view to devising plans for flood protection and determining the extent to which the United States should coöperate with the States and other communities in carrying out such plans, its share being based upon the value of the protection to navigation." The rivers named are the Cheat, Tygarts, Westport, Kanawha, Muskingum, Scioto, Miami, Maumee, Kankakee, and Wabash.

On August 3rd a serious rain storm, with a rainfall of 10 inches, which culminated in a cloudburst about 7 P. M., produced a disastrous flood at the city of Erie, Pa., with the loss of a score of lives and several millions of dollars in property damaged. Mill Creek, a small stream passing through the centre of the city, rose within two hours to a height of over 6 feet and spread across the principal street of the city—State Street—causing a failure of the foundations of many buildings and their collapse, due to the heavy wreckage which was forced against them. Bridges were also destroyed. The lesson of this flood was brought before the people in such a way that plans were prepared for an improvement of the channel and control of the stream. There was involved the construction of a closed reinforced concrete conduit and also the eliminating of all sharp bends, and the relocat-

ing of about 24,000 feet of the channel of the stream to obtain a shorter and straighter course. There was provision, too, for constructing a concrete-lined open conduit. A dry reservoir was recommended about 1¼ miles above the city line, which would have a capacity of 52,000,000 cubic feet. This reservoir would ordinarily be empty, and would be drained by a culvert large enough to pass any but extraordinary floods. The estimate of the engineer engaged to report to the city stated that the work could be done for \$798,000.

Floods in Los Angeles County during the rainy season have been a source of serious damage and the board of engineers appointed by the supervisors to study the flood control problem reported a project which would cost \$16,208,900, of which \$12,824,400 was for structures, and \$3,384,500 for right of way. This report involved a series of plans including the conservation of the run-off by diversion into the gravels in the headwater district, retardation of the run-off by contour plowing, reforestation and impeding dams, and stream-diversion in the coastal plains. There was recommended a change in the mouth of the Los Angeles River from the harbor at San Pedro to Alamitos Bay. With necessary legislation, which became effective Aug. 10, 1915, it was proposed to push the final preparations and legal steps, so that the work could be put under construction immediately. In 1914 the loss in this district was over \$10,000,000, and the need of suitable protection was brought clearly before the public. See HURRICANES.

FLORIDA. POPULATION. The population of the State, on July 1, 1915, was estimated at 870,802. The population in 1910 was 752,619.

AGRICULTURE. The acreage, production, and value of the principal crops, as estimated by the United States Department of Agriculture, in 1914-15, were as follows:

		Acreage	Prod. Bu.	Value
Corn	1915	800,000	12,000,000	\$8,760,000
	1914	700,000	11,200,000	8,960,000
Oats	1915	61,000	1,220,000	854,000
	1914	50,000	900,000	630,000
Rice	1915	500	12,000	9,000
	1914	400	10,000	7,000
Potatoes	1915	12,000	960,000	1,104,000
	1914	13,000	1,040,000	1,175,000
Hay	1915	51,000	a 61,000	976,000
	1914	48,000	65,000	1,118,000
Tobacco	1915	8,900	b 3,549,000	816,000
	1914	4,800	4,300,000	1,290,000
Cotton	1915	198,000	c 50,000	3,559,000
	1914	221,000	81,000	4,763,000

a Tons. b Pounds. c Bales.

MINERAL PRODUCTION. The only mineral production in the State is phosphate rock. In this it surpasses all the other States. There were marketed in 1914, 2,138,891 long tons of this mineral, which had a value of \$7,354,744, or 78 per cent of the entire production of the United States. As compared with the production of 1913, the output of 1914 shows a decrease of 406,385 long tons. Phosphate rock produced in the State consists of hard rock, land pebble, and river pebble. No river pebble was mined in the State in 1914, but a small amount was sold from De Soto County. The value of the total mineral production in 1914 was \$8,497,638, compared with \$10,508,016 in 1913.

FINANCE. The latest report available for the financial condition of the State is for the fiscal

year ending June 1, 1914. The receipts for the year amounted to \$3,429,784, and the disbursements to \$3,390,685, leaving a balance on hand Dec. 31, 1914, of \$1,522,769, which includes a balance at the beginning of the year of \$1,483,690. The public debt amounted to about \$600,000.

EDUCATION. The total school population of the State in 1915 was 275,310. The enrollment in the public schools was 177,154, and the average daily attendance was 126,565. The female teachers numbered 3208, and the males 1074. The average monthly salary of white male teachers was \$54.02, and of white females \$36.44. The average monthly salary of negro male teachers was \$38.91, and female teachers was \$30.74. The total school expenditure for the year 1914-15 was \$2,769,335. The Legislature of 1915 passed a number of new measures dealing with schools. These dealt chiefly with the methods of administering the finances.

CHARITIES AND CORRECTIONS. The charitable and correctional institutions of the State include an asylum for the insane; an institution for wayward boys, known as Florida Industrial School; and a school for the deaf, dumb, and blind. The Legislature of 1915 passed a measure providing for the establishment of an industrial school for girls. There were in 1915 about 1500 State prisoners.

TRANSPORTATION. The total railway mileage in the State in 1914 was 5759. Railways with the longest mileage are: the Seaboard Air Line, Atlantic Coast Line, the Florida East Coast, Louisville and Nashville Line, and the Georgia Southern and Florida.

POLITICS AND GOVERNMENT. The Legislature was in session in 1915. The so-called package law, passed by the Legislature, which forbids drinking intoxicants upon the premises where they are publicly sold, went into effect on August 1st. Under the provision of this measure, liquor may be bought in containers holding not less than half a pint. It further provides that saloons must remain closed from 6 P. M. until 7 A. M. There were no elections in 1915, and but little of political interest transpired.

STATE OFFICERS. Governor, Park M. Trammell; Secretary of State, H. C. Crawford; Treasurer, J. C. Luning; Comptroller, W. V. Knott; Attorney-General, Thomas F. West; Auditor, Ernest Amos; Adjutant-General, J. C. R. Foster; Superintendent of Public Instruction, W. N. Sheats; Commissioner of Agriculture, W. A. McRea—all Democrats.

SUPREME COURT. Chief Justice, R. F. Taylor; Justices, T. M. Shackelford, J. R. Whitfield, R. S. Cockrell, and W. H. Ellis; Clerk, G. T. Whitfield.

STATE LEGISLATURE. Both Houses are Democratic.

FLORIDA, UNIVERSITY OF. A State institution for higher education, founded in 1905, in Gainesville, Fla. The total enrollment in all departments in the autumn of 1915 was 647. The faculty numbered 57. There were no notable changes in the membership of the faculty during the year, and no noteworthy benefactions were received. The university is supported almost entirely by legislative appropriations. The productive funds amount to about \$85,000. The library contains about 15,000 volumes. The president was A. A. Murphree.

FLOTATION. See **METALLURGY.**

FLOUE. See **FOOD AND NUTRITION.**

FLY, HOUSE. See **ENTOMOLOGY**; and **INSECTS, PROPAGATION OF DISEASE BY.**

FOOD AND NUTRITION. **NUTRITION STUDIES.** The steadily advancing cost of living and the continuance of the European war led to many efforts to effect economy in the food supply. In Germany, a "war bread," in which rye flour was supplemented by about 20 per cent of potato flour, was officially recommended, although digestive disturbances from its excessive use were also reported. Blood from slaughter houses and sugar were also being added to bread to conserve the grain supply, and yeast was found to be a very digestible substitute for meat. Attempts to prepare a hay flour from alfalfa and clover, meat flour, food products from wood and straw, and a kind of tea from dried heather were also reported, as well as the direct use as food of sugar beets and lichens.

The United States Department of Agriculture studied the prevention of spoilage and waste, particularly of eggs, fish, and fruit by-products. Many fruit juices were prepared, and their distinctive colors and flavors were retained for many months by storage at about 14° F. After applying pressures of 60,000 pounds per square inch, the West Virginia Experiment Station has kept apple juice, peaches, and pears for five years without spoilage, but was less successful with berries, tomatoes, and vegetables. The California Station prepared a palatable paste from cull olives, and jellies from surplus oranges and lemons. The use of small amounts of feterita, proso, and kaoliang was suggested to replace wheat flour, and slightly sprouted wheat was found to make a bread of fair quality. Attention was drawn by the United States Bureau of Fisheries to the value of tile-fish, a deep sea fish now becoming plentiful after years of scarcity.

Langworthy and Holmes, of the Office of Home Economics, of the United States Department of Agriculture, reported studies showing a digestibility of 97 per cent for butter and lard, 93 per cent for beef fat, and 88 per cent for mutton fat. Osborne, Mendel, et al., concluded that their previous discovery of the failure of lard to promote growth was not attributable to deteriorating changes brought about in its manufacture. Tests by others of the chemically hardened vegetable oils recently put on the market for lard substitutes and other purposes indicated that these products are suitable for human food, but should not be hardened above where the melting point exceeds body temperature.

In studies of proprietary preparations for feeding infants, several investigators reported that many of these foods contain an excess of carbohydrates and a deficiency of fat. Analyses of proprietary brands of crackers, cookies, and similar package goods by the Connecticut State Station indicated that, because of their high cost, their purchase must often be justified through their value as confections rather than simply as foods. At the California Station a high nutritive value was found for the avocado, while the Oregon Station demonstrated the wide variations in value of different sorts of apples for specific cooking purposes.

The intimate relation of food to a number of specific diseases was brought out. The United States Public Health Service obtained symptoms diagnosed as pellagra in several convicts after a restricted diet consisting mainly of corn prod-

ucts, rice, sweet potatoes, and cane sirup. Modifying the diet in orphanages where the disease had been endemic by replacing a part of the carbohydrate food by fresh animal and leguminous protein foods was followed by a cessation of the disease. In other cases the exclusion of sugar and other cane products, which had been eaten in large amounts, resulted in many cures. Beriberi was also ascribed to a diet deficient in some food principle. In Poland, many people who had lived almost wholly on potatoes for several months were found to have developed symptoms of heart disease and dropsy, which disappeared with better nourishment and improved hygienic conditions. Other cases of potato poisoning were attributed to the activities of yeast or bacteria rather than to solanin. Bacteria in duck eggs were claimed to have caused food poisoning, and sterilization by long-continued boiling was advised. Such foods as ice cream and spaghetti were proved to be possible carriers of the typhoid fever bacillus, neither freezing for long periods nor baking destroying its viability. Similarly, studies of carbonated beverages by the Kentucky Station showed that carbonation killed many but not all the organisms, and indicated the great importance of a pure water supply and sanitary methods.

COST OF FOOD. *Bradstreet's* recorded for Dec. 1, 1915, the highest commodity index in its history. This showed an increase of over 17 per cent over the previous year, and 11.5 per cent over the former high-water mark in 1912. Wholesale prices for wheat, corn, flour, ham, butter, cheese, coffee, sugar, tea, salt, rice, beans, peas, potatoes, lemons, mackerel, cranberries, raisins, and currants were still higher than in 1914, but those for live and dressed meats, eggs, milk, and apples were in general lower. Despite the advancing cost of living, however, *Bradstreet's* maintained that "it is worth noting that in 1912 the dearth of commodities worked widespread agitation, whereas just now discontent is negligible."

FOOD INSPECTION. The cases reported for prosecution under the United States Food and Drugs Act numbered 820, of which 325 were criminal cases. There were also 155 cases reported under the meat inspection law, and 6713 importations of food were denied entry.

Connecticut, Hawaii, Michigan, New Jersey, North Carolina, and Oregon were added to the States requiring the net weight of package goods to be shown. Arizona, Massachusetts, and Minnesota required the labeling of cold storage eggs; Connecticut of pasteurized milk; North Carolina of bleached flour; California, Montana, Oregon, and Washington of eggs and dairy products from foreign countries; and Montana and Oregon of meat and meat products as well. Pennsylvania regulated the handling of meat and meat food products, as well as the sanitation of restaurants, etc. Delaware provided for the inspection of fruit and vegetable canneries, and Vermont of creameries and cheese factories. Florida and Missouri required the screening from flies of food producing and handling establishments, and Oregon the licensing of all persons catching, canning, or handling food fish. Massachusetts provided for bread inspection, California further regulated cold storage practices, and Illinois the traffic in spoiled eggs. Nebraska and North Dakota also amended their pure-food laws.

BOOKS OF THE YEAR. The following may be

mentioned: Ruth A. Wardall and Edna N. White, *A Study of Foods* (Boston); Edith H. Forster and Mildred Weigley, *Foods and Sanitation* (Chicago); Mary D. Chambers, *Principles of Food Preparation* (Boston); E. T. and Lilian Brewster, *The Nutrition of a Household* (Boston); Mildred Bulkley, *The Feeding of School Children* (London); and S. Nearing, *Reducing the Cost of Living* (Philadelphia).

See also **CHEMISTRY**, **GENERAL PROGRESS OF**, **Organic Chemistry**.

FOOT-AND-MOUTH DISEASE. See **VETERINARY MEDICINE**.

FOOTBALL. Rugby football attained its greatest heights in 1915. It is estimated that 32,000 games were played by the various college and school teams throughout the United States, and that these contests drew a total attendance of 6,000,000 persons. The play itself, too, was more spectacular than ever before, this fact being due to the increased familiarity shown with the new rules which place a premium on the open game.

Undoubtedly the strongest eleven of the season was Cornell, which went through its schedule without suffering a defeat. Harvard, Pennsylvania, and Michigan were among the teams which fell before Dr. Al Sharpe's powerful and well balanced aggregation. Harvard deserves second ranking and many experts maintain that at the close of the season the Crimson squad, coached by Percy D. Haughton, was the equal, if not the superior, of Cornell.

Harvard was well satisfied with its record as a whole, despite its defeat by the Ithacans, for the Cambridge men accomplished their two chief tasks, the overthrow of Princeton and Yale. The triumph over the Elis was the most complete ever gained by a Harvard eleven, the score being 41 to 0.

The University of Pittsburgh would naturally dispute Harvard's claim to second place, for this team, like Cornell, went through the season without losing a game. The fact remains, however, that Pittsburgh did not meet elevens possessing the strength exhibited by the Crimson's opponents.

Princeton must receive serious consideration for fourth place, although it lost to Yale, which had been defeated by four so-called "minor" teams in Virginia, Washington and Jefferson, Colgate, and Brown. The ranking of the other college elevens is a hard problem, but closest followers of the sport placed them in this order: Syracuse, Dartmouth, Colgate, Penn State, Washington and Jefferson, Rutgers, Brown, Pennsylvania, and Yale.

Among the individual stars of the year, Charlie Barrett, leader of the Cornell team, and Eddie Mahan, the Harvard captain, were pre-eminent. Other gridiron players of note were: Oliphant, of the Army; Captain Glick, of Princeton; Shiverick, of Cornell; Tallman, of Rutgers; Nash, of Rutgers; King, of Harvard; Miller, of Columbia; Cahall, of Lehigh; and Peck, of Pittsburgh.

In the West the strongest elevens were: Washington State, University of Washington, Oregon Aggies, Michigan Aggies, Illinois, and Minnesota. Vanderbilt and Virginia made the best showing of the Southern teams.

Walter Camp made the following selections for his All-America first team:

Ends, Baston, Minnesota, and Shelton, Cor-

nell; tackles, Gilman, Harvard, and Abell, Colgate; guards, Spears, Dartmouth, and Schlachter, Syracuse; centre, Peck, Pittsburgh; quarterback, Barrett, Cornell; halfbacks, King, Harvard, and Macomber, Illinois; fullback, Mahan, Harvard.

A summary of the games played by the leading college teams follows:

Cornell 13, Gettysburg 0; Cornell 34, Oberlin 7; Cornell 46, Williams 6; Cornell 41, Bucknell 0; Cornell 10, Harvard 0; Cornell 45, Virginia P. I. 0; Cornell 34, Michigan 7; Cornell 40, Washington and Lee 21; Cornell 24, Pennsylvania 9.

Harvard 39, Colby 6; Harvard 7, Massachusetts Aggies 0; Harvard 29, Carlisle 7; Harvard 9, Virginia 0; Harvard 0, Cornell 10; Harvard 13, Penn State 0; Harvard 10, Princeton 6; Harvard 16, Brown 7; Harvard 41, Yale 0.

University of Pittsburgh 32, Westminster 0; Pittsburgh 47, United States Naval Academy 12; Pittsburgh 45, Carlisle 0; Pittsburgh 14, Pennsylvania 7; Pittsburgh 42, Allegheny 7; Pittsburgh 19, Washington and Jefferson 0; Pittsburgh 28, Carnegie Tech. 0; Pittsburgh 20, Penn State 0.

Princeton 13, Georgetown 0; Princeton 10, Rutgers 0; Princeton 3, Syracuse 0; Princeton 40, Lafayette 3; Princeton 30, Dartmouth 7; Princeton 27, Williams 0; Princeton 6, Harvard 10; Princeton 7, Yale 13.

Syracuse 43, East Syracuse 0; Syracuse 6, Bucknell 0; Syracuse 0, Princeton 3; Syracuse 82, Rochester 0; Syracuse 6, Brown 0; Syracuse 14, Michigan 7; Syracuse 73, Mount Union 0; Syracuse 38, Colgate 0; Syracuse 0, Dartmouth 0.

Dartmouth 13, Massachusetts Aggies 0; Dartmouth 34, Maine 0; Dartmouth 20, Tufts 7; Dartmouth 60, Vermont 0; Dartmouth 7, Princeton 30; Dartmouth 20, Amherst 0; Dartmouth 7, Pennsylvania 3; Dartmouth 29, Bates 0; Dartmouth 0, Syracuse 0.

Colgate 44, Susquehanna 0; Colgate 44, Rochester 0; Colgate 13, West Point 0; Colgate 107, Rensselaer Poly. 0; Colgate 15, Yale 0; Colgate 0, Syracuse 38.

Penn State 26, Westminster 0; Penn State 14, Lebanon 0; Penn State 13, Pennsylvania 3; Penn State 27, Gettysburg 12; Penn State 28, West Virginia 0; Penn State 0, Harvard 13; Penn State 7, Lehigh 0; Penn State 33, Lafayette 3; Penn State 0, Pittsburgh 20.

Washington and Jefferson 6, Geneva 0; Washington and Jefferson 6, West Virginia 6; Washington and Jefferson 17, Lafayette 0; Washington and Jefferson 34, Westminster 0; Washington and Jefferson 16, Yale 7; Washington and Jefferson 41, Muskingum 7; Washington and Jefferson 0, Pittsburgh 19; Washington and Jefferson 7, West Virginia 3; Washington and Jefferson 59, Bethany 0; Washington and Jefferson 27, Lehigh 3.

Rutgers 53, Albright 0; Rutgers 0, Princeton 10; Rutgers 96, Rensselaer 0; Rutgers 21, Muhlenberg 0; Rutgers 41, Springfield Y. M. C. A. College 13; Rutgers 28, All Stars 7; Rutgers 39, Stevens 3; Rutgers 70, New York University 0.

Association football, or soccer, gained many recruits during the year 1915. The National Challenge Trophy, emblematic of the championship of the United States Football Association, was won by the Bethlehem Club, the final match being played on Taylor Field, Lehigh University,

with the Brooklyn Celtics as the opponents of the new champions. The score was 3 to 1.

The Celtics made an excellent showing as they also were finalists in the cup tie of the American Football Association, which was won by the Scottish-Americans of Newark, N. J. The Celtics were more successful in the New York State series, capturing the championship for the third successive year.

The West Hudsons won the championship of the National League, and the United Hudsons carried off the honors in the Metropolitan League. The intercollegiate soccer title went to Haverford, after a spirited race in which Pennsylvania was the chief contender.

In England the principal series were contested despite the fact that many of the leading players answered the call to the colors.

FOOTEITE. See MINERALOGY.

FORD PEACE TRIP. See UNITED STATES AND THE WAR.

FOREIGN CREDITS. See FINANCIAL REVIEW, section so entitled.

FOREIGN RELATIONS. See UNITED STATES.

FOREIGN TRADE. See FINANCIAL REVIEW.

FORESTRY. The year 1915 promised to be a bad year for forest fires. Many thousand acres of forest and suburban woodland in the Eastern United States and in Canada were burned over during the early spring by fires which started for the most part from preventable causes. Rains during the latter part of April helped the situation somewhat, and reports from different parts of the country since that time indicated that the damage from forest fires for the year as a whole would be much less than for many years past. The successful results of the Federal fire protective system on the National Forests was yearly inducing more States to take up the work of forest protection. The estimated loss from forest fires in the Dominion of Canada for 1915 was \$10,000,000. Formerly the railroads were the principal offenders in starting fires. During the year 1915, however, the majority of the losses resulted from settlers' fires, there being no serious loss along the lines of railroad governed by the Dominion Board of Railway Commissioners and their forest protective regulations.

At least 80 lots of imported white pine infected with white-pine blister rust had been located in the United States and Canada during the previous five years. Most of these infections had been eradicated, but from eight of them outbreaks of the disease in native pines occurred. The largest of these outbreaks recently developed along the Niagara River in Ontario, fortunately, however, in an isolated region. In the United States the eastern white pine (*Pinus strobus*) was, in 1915, the only one affected. In Europe, however, the disease attacked other five-needle pines, and consequently the five-needle pines of the Western States were endangered.

The importation of European pine to the United States was prohibited after July 1, 1915. This action was taken to save American pine trees from the pine shoot moth which had long done much damage in European forests. The Canadian government prohibited the importation into Canada of all forest plant products from Maine, Massachusetts, New Hampshire, Connecticut, and Rhode Island, unless accompanied by a

certificate of the United States Department of Agriculture showing them free from gypsy moth.

THE NATIONAL FOREST SERVICE. On March 31, 1915, there were 162 National Forests in the United States, with a total area of 184,611,596 acres, of which 21,337,533 acres were private land. During the previous five years about 14,000,000 acres had been released either for agricultural purposes or because they were unsuited for permanent forest purposes. Some recent eliminations for the latter cause included 5,802,000 acres, or nearly one-half of the Chugach Forest in Alaska, and the Kansas National Forest in the Sand Hill region of Western Kansas. About 1,900,000 acres were made available under the Forest Homestead Law for the benefit of 18,000 settlers. The total receipts from the National Forests during the year ended June 30, 1915, approximated \$2,500,000, of which amount over \$850,000 went to the States in which the forests are situated for county school and road purposes.

With the close of the fiscal year ended June 30, 1914, appropriations for purchase under the Weeks Law (see FORESTRY in YEAR BOOK for 1912) of lands for protecting watersheds of navigable streams terminated. Of the \$11,000,000 appropriated for this purpose to be expended during the fiscal years 1910 to 1915 \$3,000,000 lapsed before contracts of purchase could be completed. With the remaining \$8,000,000 the National Forest Reservation Commission approved the purchase of lands in 16 localities of the Southern Appalachian and White Mountains, involving a total area of 1,317,551 acres. This was acquired or bargained for at an average price of \$5.22 per acre. In 1914 the Commission recommended that purchases be continued until about 6,000,000 acres are acquired, and that Congress authorize appropriations through another five-year period at the rate of \$2,000,000 a year. In his report to the President, the secretary of agriculture recommended that purchases should continue until areas sufficient to be influential in protecting the watersheds are acquired.

LEGISLATION. In order to encourage the use of National Forest land for recreational purposes—summer homes, resorts, etc.—Congress passed a law in March authorizing the secretary of agriculture to lease lands in tracts of not more than five acres for periods not to exceed 30 years. More than 2000 cottages had been built under the old permit system and a large number of applications under the new leasing system had been received.

Massachusetts passed a law carrying an appropriation of \$75,000, empowering the State forester to employ needy persons on the State forests in the work of forest protection and development. Working under the Municipal Forest Law, Fitchburg, Mass., set aside 105 acres of land to be known and used as a Town Forest. New Hampshire provided for the conveyance of lands to the State for reforestation. After 10 years the lands can be repurchased by paying the cost of improvements and 4 per cent interest. In Vermont, cities and towns were authorized to buy lands for forestry purposes, the profits to be used for the schools of each place. The State forester is to manage tracts of over 40 acres. In Pennsylvania, counties are permitted to sell tax lands for reforestation through the State forest service. Texas provided for a State Board of Forestry and a State forester. The Governor may

accept for the State gifts of lands for forest reserves and similar lands may be purchased. West Virginia created the position of State forester in the Department of the Forest, Game, and Fish Warden. State cut-over lands in Washington that are suitable for reforestation may be perpetually reserved, reforested, and handled as State forests.

ALASKAN TIMBER RESERVE. A timber reserve approximately 200 miles in length and from 5 to 10 miles in width, was established by presidential order on the public lands north of the Chugach National Forest. The purpose of the reservation was to prevent the timber needed for the construction of the government railroad from falling into the possession of individuals or corporations. Only the timber on the land, not the land itself, has been reserved.

FOREIGN COUNTRIES. With the continuance of the great war forest activities in Europe were almost at a standstill, except that many trained foresters and many valuable forests were sacrificed in the conflict. American foresters were pleased to learn that Dr. C. A. Schenk, former director of Biltmore Forest School, who was seriously wounded in battle in France, did not die as reported last year but recovered after a long convalescence.

The International Colonial Institute at Brussels issued a symposium in three volumes dealing with the forest laws and forest administration in the colonies of Great Britain, Holland, Germany, Italy, and France, the Philippines, Hawaii, Porto Rico, etc. The subject matter was prepared by various authorities.

Russia in 1915 occupied first place among the nations of the world in the extent of its timber resources. The forests in European Russia covered an area of 474,000,000 acres; in Finland, 50,500,000 acres; in Poland, 6,700,000 acres; and in the Caucasus, 18,600,000 acres; a total of 549,800,000 acres, exclusive of Siberia. The Russian Forestry Department placed the total timberland in Siberia at 810,000,000 acres, of which two-thirds could be successfully placed on the market. The government owned 285,598,941 acres of forest land in European Russia, 12,826,387 acres in the Caucasus, 360,519,435 acres in Asiatic Russia, and 288,742,000 acres in the Amur region, a total of 947,686,763 acres. Twenty-three per cent of the forest land belonged to landed proprietors and 9 per cent to the peasantry in 1910.

As the results of experiments carried out by a Swedish expert it was ascertained that *Araucaria imbricata*, a tree which abounds in Argentina and Chile, provided excellent raw material for wood pulp, better even in quality than that usually employed in making paper pulp in both Europe and the United States. Three and one-half average trees suffice to produce one ton of pulp. Two and one-half trees will produce one ton of news print paper.

A survey of Ireland's timber resources showed that of the total area of the country only 297,809 acres, or 1.4 per cent, was under woods. The rates of cutting and planting during the previous 10 years showed a deficiency of 4341 acres in the planted area necessary to maintain a permanently stocked acreage of woodland.

The director of the Philippine Bureau of Forestry who recently returned from a trip to China in the interests of Philippine lumber, reported that there was a market for all the lumber pro-

duced in the islands if the dealers could receive a guaranty of a constant supply.

The Venezuelan government recently created a Central Commission of Forestry and Water Supplies to fulfill the duties indicated by its name.

The year 1915 witnessed the development of a growing reforestation movement in China. The University of Nanking opened a school of forestry in March with an enrollment of 17 students. The event was commemorated by ceremonial tree planting on Purple Mountain, near Nanking. Three scholarships in the school were provided by the forestry fund committee of Shanghai.

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FORMAN, JUSTUS MILES. American writer, died May 7, 1915. He was born in Le Roy, N. Y., in 1875, and graduated from Yale in 1898. For three years he studied art at Paris. His talent was more for literature than for art, however, and he took to authorship, writing stories profusely for the magazines, and also many novels. Among his books are *The Garden of Lies* (1902); *The Journey's End* (1903); *Jason* (1909); *The Unknown Lady* (1911); *The Open Door* (1913); and *The Blind Spot* (1915). He was the author also of several successful plays. Mr. Forman was a victim of the sinking of the *Lusitania*. See DRAMA, AMERICAN AND ENGLISH.

FORMOSA, or TAIWAN. An island dependency of Japan off the coast of the Chinese Province of Fukien. The capital is Dai-Hoku (or Taipei). Formosa Island has an area of 2318.5 square ri; the seven adjacent isles, 5.6 square ri; total, 2324.1 square ri (13,841 square miles). The estimated population at the end of 1914 was 3,612,184; at the end of 1912, 3,476,679 (1,825,518 males, 1,651,161 females), of whom the indigenes numbered 3,335,957; Japanese, 122,793; and foreigners, 17,929. Estimated population of the larger towns Dec. 31, 1911: Dai-Hoku (consisting of Jonai, Moko, and Daitote), 95,077; Dainan (or Tainan), 59,601; Kaga (or Chia-i), 22,418; Rokko (or Lukong), 19,153; Kiilung (or Keelung), 17,962; Shinchiku (or Hsinchu), 16,294; Gilan (or Ilan), 16,062; Shokwa (or Changhua), 15,545; Taku (or Takow), 13,775; Daichiu (or Taichu), 12,788.

Japan acquired Formosa from China by cession in 1895 and instituted civil government in the following year. Many improvements have

been made, including the establishment of an educational system.

The agricultural products include rice and other cereals, tea, sugar, sweet potatoes, jute, and hemp. By far the most important crop is rice, which was planted to 485,213 cho in 1912 (1 cho = 2.45 acres); the yield was 4,046,611 koku (1 koku = about 1.804 hectoliters, or 4.963 English bushels). In 1912 cattle numbered 446,587; goats, 126,270; and swine, 1,276,607. The forest area of Formosa is reported at 2,862,712 cho. An important forest product is camphor, which is worked as a government monopoly. The mineral output in 1912 was valued at 4,302,969 yen, as compared with 2,266,292 in 1907; gold produced in 1912 was valued at 2,136,660 yen; copper, 1,031,460; oil, 892,136; and silver, 132,416. The value of fishery produce in 1912 is stated at 992,737 yen. Manufactures include flour, sugar, spirits, tobacco, oil, soap, etc. The figures below represent, in yen, imports and exports from and to foreign countries and from and to Japan (including Korea, etc.).

	Imports		Exports	
	Foreign	Japan	Foreign	Japan
1908	11,009,464	11,194,788	11,078,321	9,729,459
1911	19,555,047	83,739,556	13,175,590	51,648,586
1912	19,307,126	48,825,290	14,960,228	47,831,451
1913	18,023,724	42,835,593	12,942,442	40,446,620

The larger classified imports and exports (including both foreign and Japanese, but excluding the small trade with Korea) were as follows in 1913: rice, other cereals, etc., 5,885,843 and 16,010,567 yen respectively; other foodstuffs, together with beverages and tobacco, 13,256,303 and 23,878,561; drugs, colors, etc., 6,511,275 and 8,252,501; cotton yarn, fabrics, etc., 7,720,661 and 724,824; minerals, pottery, metal goods, etc., 3,076,709 and 2,963,182. Imports from and exports to China in 1912, 6767 and 4264 thousand yen; United Kingdom, 3490 and 1087; British India, 2173 and 342; United States, 1700 and 4917; Germany, 1072 and 1573. Reported length of state and private railway open in 1913 (including light railways on sugar estates), 690 miles.

Revenue and expenditure in 1912-13, 60,295,858 and 47,188,576 yen respectively; the budget for 1913-14 balanced at 47,525,015 yen; for 1914-15, 48,337,133. Formosa is administered by a Governor-General (Lt. Gen. Count Sakuma Samata), resident at Dai-Hoku.

FORSYTH, GEORGE ALEXANDER. American soldier, died Sept. 12, 1915. He was born in Muncy, Pa., in 1837, and received an academic education. He enlisted as a private in the Chicago Dragoons in 1861; in the same year became first lieutenant in the eighth Illinois cavalry; was promoted to be captain in 1862, and major in 1863; and in 1866 was mustered out of the volunteer service, and into the regular army as major in the ninth United States cavalry. He was appointed to be lieutenant-colonel of cavalry in 1881, and was retired from service in 1890. In 1904 he was advanced by an act of Congress to the rank of colonel. He received a brevet as colonel of volunteers in 1864 for gallant and meritorious service at Winchester, and was brevetted brigadier-general of the volunteers in 1865 for distinguished service and conspicuous gallantry. General Forsyth fought during the entire war in

the army of the Potomac. He took part in 16 battles, 6 skirmishes, and over 60 minor engagements. He was four times wounded. From 1869-73 he acted as military secretary to Lieutenant-General Sheridan, and was an aid to Sheridan from 1878-81. He achieved much distinction as an Indian fighter, and his celebrated battle with "Old Roman Nose" and 2000 Cheyenne warriors on the Republic River in Kansas was one of the most thrilling engagements in Indian warfare. The Indians held General Forsyth and his small band at bay for two and one-half days on a sand bar in the river. "Old Roman Nose" and many of the Indians were killed, and all of the white men were either killed or wounded. General Forsyth took part as a staff official in Sheridan's famous ride from Winchester to Cedar Creek. He wrote *Thrilling Days in Army Life* and *The Story of the Soldier*, both published in 1900.

FORSYTH, JOHN MCQUEEN. Admiral, retired, of the United States navy, died Aug. 3, 1915. He was born in the Bahamas in 1842, and at the age of 11 removed to the United States, settling with his family in Philadelphia. He graduated from the Central High School of that city in 1858, and in the same year went to sea before the mast. Three years later he enlisted as a volunteer in the navy, and in 1861 was appointed acting master's mate. He served throughout the Civil War, in the South Atlantic and West Gulf squadrons; took part in the capture of Forts Clarke and Hatteras, in 1861; and was with Admiral Farragut in the naval fights on the Mississippi. He was in the engagement with the Confederate ram *Arkansas*. Promoted to be lieutenant in 1868, he became commander in 1899, and captain in the following year. His last sea duty was in command of the battleship *Indiana*, to which he was assigned in August, 1901. In September, 1901, he was retired, at his own request, and with the rank of rear-admiral.

FORTIFICATIONS. See MILITARY PROGRESS.

FORWOOD, WILLIAM HENRY. American soldier, died May 11, 1915. He was born in Brandywine Hundred, Del., in 1838, and graduated from Crozier Academy in 1856, afterward studying medicine at the University of Pennsylvania. In 1861 he was appointed assistant surgeon in the United States army, and served throughout the Civil War. At its close he was promoted to be captain and assistant surgeon, and rose through the several ranks until he was appointed in 1902 brigadier-general and surgeon-general. He received two brevets for gallantry during the Civil War. He served also in the Indian campaigns, and was surgeon and naturalist in Sheridan's exploring expeditions in 1880-82. In 1898 he built the Montauk Hospital. He retired from active service in 1902. He was for many years professor of surgical pathology in the Georgetown Medical College, and he was also professor of medical surgery at the Army Medical School. He was a member of many medical and scientific societies, and wrote much on medical subjects and on natural history in periodicals.

FOSDICK, CHARLES AUSTIN. American writer, whose pen name was "Harry Castleman," died Aug. 22, 1915. He was born in Randolph, N. Y., in 1842, and received a high school education in Buffalo. At the outbreak of the Civil

War he shipped as landsman in the Mississippi squadron. He passed through all intermediate classes, and at the end of the war was receiver and superintendent of the coal of the squadron. Practically all the remainder of his life was given to writing stories for boys. Many of his books embodied his experiences during the Civil War. He was one of the most popular of American writers of juvenile stories. Among his numerous books are: *The Boy Trapper*; *Buried Treasure*; *Sailor Jack, the Trader*; *The Houseboat Boys*; *The Pony Express Rider*; and *The White Beaver*.

FOURTH OF JULY INJURIES. The *Journal of the American Medical Association* compiled its 13th annual report of deaths and injuries resulting from the celebration of the Fourth of July. In the 13 years a total of 43,951 persons were killed or injured in the celebration. The total of 1915 showed a gratifying improvement over previous years, except in a few localities. There was only one death from lockjaw, although 294 blank cartridge wounds were reported. The decrease in tetanus is believed to be due to the general and prompt use of antitoxin. In all there were 30 deaths from fireworks injuries; 5 persons were killed by firearms; 5 by explosions of powder, bombs, or torpedoes; 6 by cannon; and 2 by other forms of fireworks. Eleven persons, mostly little girls or small children, were burned to death. Of non-fatal injuries there were 1135. One person was totally blinded, 11 lost one eye each, 5 lost legs, arms, or hands, and 38 lost one or more fingers. The large cities showing the greatest number of accidental injuries are: Philadelphia, with 1 killed and 280 injured; New York, 272 injured; St. Louis, 47 injured; Boston and Hartford, Conn., 27 casualties each; while Chicago had only 8 casualties, but 5 of these fatal. See TETANUS.

FOWLER, THOMAS POWELL. American railway officer, died Oct. 12, 1915. He was born in Newburgh, N. Y., in 1851, and was educated at Columbia and at Heidelberg universities. He practiced law for several years in New York City with great success. In 1886 he was president of the New York, Ontario, and Western Railroad; and he was interested in other railroads and in various financial institutions.

FOX, JOSEPH JOHN. Roman Catholic bishop, died March 15, 1915. He was born in Green Bay, Wis., in 1855, and was graduated at the Cathedral School at Green Bay, at St. Francis Seminary, Milwaukee, and at the University of Louvain. From the last named institution he received the degree of D.D. in 1879. In the same year he was ordained a priest. His first pastoral work was at New Franken, Wis. He was afterwards for three years in charge of St. John's Church, Green Bay. In 1896 he was appointed vicar-general of the diocese of Green Bay, serving until 1904; and in 1898 domestic prelate to Pope Leo XIII. He was appointed bishop of Green Bay in 1904.

FRANCE. A republic in western Europe. Capital, Paris.

AREA AND POPULATION. The area is stated at 53,646,374 hectares, equivalent to 536,464 square kilometers, or 207,129 square miles. The table following gives, by departments, areas in square kilometers, legal population according to the censuses of 1911 and 1906, and density in 1911.

	Sq. km.	1911	1906	D.		Sq. km.	1911	1906	D.
Ain	5,825.60	342,482	345,856	58.8	Sèvres	6,054.34	337,627	339,466	55.8
Aisne	7,428.35	530,226	534,495	71.4	(Deux)	6,277.12	520,161	532,567	82.9
Allier	7,881.83	406,291	417,961	50.0	Tarn	5,780.44	324,090	330,533	56.1
Alpes					Tarn-et-				
(Bassée)	6,988.40	107,231	113,126	15.3	Garonne ..	3,730.56	182,537	188,553	48.9
Alpes					Var	6,028.39	330,755	324,638	54.9
(Hautes)	5,643.11	105,083	107,498	18.6	Vaucluse ...	3,578.46	238,656	239,178	66.7
Alpes-					Vendée	7,015.33	438,520	442,777	62.5
Maritimes ..	3,736.26	356,338	334,007	95.4	Vienne	7,044.14	332,276	333,621	47.2
Ardèche	5,556.07	331,801	347,140	59.7	Vienne				
Ardennes	5,252.59	318,896	317,506	60.7	(Haute) ..	5,555.23	384,736	385,732	69.2
Ariège	4,903.33	198,725	205,684	40.5	Vosges	5,903.03	433,914	429,812	73.5
Aube	6,026.29	240,755	243,670	39.9	Yonne	7,460.64	303,889	315,199	40.7
Aude	6,342.27	300,537	308,327	47.4					
Aveyron	8,771.13	369,448	377,299	42.1	Totals	53,646.37	39,601,509	39,252,245	78.8
Bouches-du-									
Rhône	5,247.95	805,532	765,918	153.5					
Calvados	5,692.61	396,318	403,431	69.6					
Cantal	5,779.33	228,861	228,690	38.6					
Charente	5,971.73	346,424	351,733	58.0					
Charente-In-									
férieure	7,231.51	450,871	453,793	62.3					
Cher	7,803.53	337,810	348,484	46.3					
Corrèze	5,887.65	309,646	317,430	52.6					
Corse	8,721.82	299,820	291,160	33.1					
Côte-d'Or	8,786.77	350,044	357,950	39.8					
Côtes-du-Nord	7,217.64	605,523	611,506	39.9					
Creuse	5,606.13	266,188	274,094	47.5					
Dordogne	9,224.20	437,432	447,052	47.4					
Doubs	5,260.03	299,935	298,438	56.9					
Drôme	6,561.36	290,894	297,280	44.3					
Eure	6,037.48	323,651	330,140	53.6					
Eure-et-Loir ..	5,939.80	272,255	273,823	45.8					
Finistère	7,029.47	809,771	795,103	115.2					
Gard	5,880.65	413,358	421,166	70.3					
Garonne									
(Haute)	6,366.99	432,126	442,065	67.9					
Gers	6,290.58	221,994	231,188	35.3					
Gironde	10,725.60	829,095	823,925	77.3					
Hérault	6,224.27	430,484	432,779	77.2					
Ille-et-Vilaine	6,992.34	608,093	611,805	86.9					
Indre	6,906.44	287,673	290,216	41.1					
Indre-et-Loir ..	6,158.47	341,205	287,916	55.4					
Isère	8,286.58	555,911	562,315	67.5					
Jura	5,055.25	252,713	257,725	50.0					
Landes	9,364.04	288,902	293,397	80.8					
Loir-et-Cher ..	6,421.86	271,231	276,019	42.2					
Loire	4,799.31	640,549	643,934	138.5					
Loire									
(Haute)	5,001.39	303,838	314,770	60.7					
Loire-In-									
férieure	6,979.97	669,920	666,748	95.7					
Loiret	6,311.88	364,061	364,999	53.4					
Lot	5,226.13	205,769	216,611	39.4					
Lot-et-									
Garonne	6,384.76	268,083	274,610	49.8					
Lozère	5,179.82	122,738	128,016	23.7					
Maine-et-									
Loire	7,218.03	508,149	513,490	70.4					
Manche	6,411.68	476,119	487,443	74.3					
Marne	8,205.31	436,310	434,157	53.2					
Marne									
(Haute)	6,256.95	214,765	221,724	34.3					
Mayenne	5,212.23	297,732	305,457	57.1					
Meurthe-et-									
Moselle	5,279.56	564,730	517,508	107.0					
Meuse	6,240.57	277,955	280,220	44.5					
Morbihan	7,092.49	578,400	573,152	81.5					
Nièvre	6,388.14	299,312	313,972	43.4					
Nord	5,773.73	1,961,780	1,896,861	339.7					
Oise	5,886.73	411,028	410,149	69.8					
Orne	6,144.10	307,433	315,993	50.0					
Pas-de-Calais ..	6,751.56	1,068,155	1,012,466	158.2					
Puy-de-Dôme ..	8,016.13	525,916	535,419	65.6					
Pyrénées									
(Bassée)	7,712.38	443,318	425,817	56.2					
Pyrénées									
(Hautes)	4,534.49	206,105	209,397	45.5					
Pyrénées-									
Orientales ..	4,143.50	212,986	213,171	51.4					
Belfort (Ter-									
ritoire de) ..	6,084.90	101,386	95,421	166.6					
Rhône	2,859.34	915,581	858,907	322.0					
Saône									
(Haute)	5,375.24	257,606	263,890	47.9					
Saône-et-Loire	8,627.41	604,446	613,377	70.1					
Sarthe	6,244.79	419,370	421,470	67.1					
Savoie	6,187.91	247,890	253,297	40.0					
Savoie									
(Haute)	4,598.01	255,137	260,617	55.5					
Seine	4,795.00	4,154,042	3,848,618	8664.5					
Seine-In-									
férieure	6,341.99	877,383	863,879	188.4					
Seine-et-Marne	5,931.07	363,561	361,939	61.3					
Seine-et-Oise ..	5,658.94	817,617	749,753	144.5					

Some of the principal cities, with their communal population in 1911, are as follows: Paris, 2,888,110 (1,053,262 in 1851); Marseilles, 550,619; Lyons, 523,796; Bordeaux, 261,678; Lille, 217,807; Nantes, 170,535; Toulouse, 149,576; Saint-Etienne, 148,656; Nice, 142,940; Le Havre, 136,159; Rouen, 124,987; Roubaix, 122,723; Nancy, 119,949; Reims, 115,178; Toulon, 104,582; Amiens, 93,207; Limoges, 92,181; Brest, 90,540; Angers, 83,786; Tourcoing, 82,644; Nîmes, 80,437; Montpellier, 80,230; Rennes, 79,372; Grenoble, 77,438; Dijon, 76,874; Tours, 73,398; Calais, 73,322; Orléans, 72,096; Saint-Denis, 71,759; Le Mans, 69,361; Levallois-Perret, 68,703; Clermont-Ferrand, 65,386; Versailles, 60,458; Besançon, 57,978; Boulogne-sur-Seine, 57,027; Saint-Quentin, 55,571; Troyes, 55,486; Boulogne, 53,128; Béziers, 51,042; Avignon, 49,304; Lorient, 49,039; Caen, 46,934; Clichy, 46,676; Bourges, 45,735; Neuilly-sur-Seine, 44,616; Cherbourg, 43,731; Montreuil, 43,217; Asnières, 42,583; Villeurbanne, 42,526; Saint-Ouen, 41,904; Poitiers, 41,242; Perpignan, 39,510; Belfort, 39,371; Dunkerque, 38,891; Vincennes, 38,568; Ivry, 38,307; Saint-Nazaire, 38,267; Angoulême, 38,211; Courbevoie, 38,138; Aubervilliers, 37,558; Pau, 37,149; Roanne, 36,697; La Rochelle, 36,371; Pantin, 36,359; Douai, 36,314; Le Creusot, 35,587; Rochefort, 35,019.

EDUCATION. In 1911 the conscription list carried 301,467 men of the class of 1910. Degree of instruction of 18,093 of these, unknown. Of the other 283,374, 2.79 per cent could neither read nor write, 1.31 per cent could read only, 27.44 per cent could read and write, 65.98 per cent had acquired a more extensive primary education, and 2.30 per cent were graduates of secondary institutions. In 1913 the conscription list carried 309,580 men of the class of 1912, of whom 2.48 per cent could neither read nor write, 1.37 could read only, 28.76 could read and write, 54.76 had received other primary instruction, 2.57 were graduates, 2.17 had received degrees, and 7.89 remained unclassified.

Infant schools (1912-13), 3868 (2660 public and 1208 private lay schools), with 8410 teachers and 583,074 pupils. Primary schools, including superior primary schools, 81,489, with 156,189 teachers, and 5,508,534 pupils. State expenditure for primary instruction during the year 1912, 225,477,137 francs.

Secondary public schools (1912-13): 343 lycées and colleges for boys (100,203 students), and 139 for girls (33,282); 55 secondary courses for girls (5076 pupils). Students in universities, Jan. 15, 1914, 42,037.

AGRICULTURE. Of the productive area (1909), 23,615,220 hectares were under crops (including sown meadows), 4,837,610 under natural meadows, 1,577,220 under forage plants, 3,627,330 un-

der pasture, 1,686,942 under vines, 1,220,150 under industrial plants, truck gardens, etc., 9,329,193 under woods and forests; 3,843,520 hectares were fallow or uncultivated; 3,218,579 not included in any of the foregoing. As calculated in 1912: 23,747,220 hectares cropped, 4,898,510 meadows, 1,572,440 forage plants, 3,613,290 pasture, 1,624,213 vines, 251,560 industrial plants, etc., 1,098,450 various and uncultivated, 2,615,705 not included in foregoing—a total of 52,952,579 hectares.

A table of cereal crops follows—year 1912, area sown in hectares, yield by measure in hectolitres and by weight in metric quintals, and value in thousands of francs:

	Ha.	Hctle.	Qs.	1000 fr.
Wheat	6,571,580	118,505,800	90,991,500	2,523,289
Maize	128,750	2,120,260	1,554,620	87,101
Rye	1,201,630	17,228,900	12,382,200	280,010
Barley	759,630	17,295,400	44,014,200	216,499
Buckw't	461,280	7,888,320	5,006,940	112,350
Oats	2,981,980	110,531,900	51,451,600	1,091,979
Corn	476,480	8,222,070	6,028,680	144,749
Millet	21,170	227,785	154,555	.....

The following table gives provisional figures for 1914-15, and final figures for 1913-14 for area under main crops in hectares, total yield in quintals, and quintals yielded per hectare in 1913-14. These figures are exclusive of territory invaded by the enemy.

	Hectares		Quintals		Qs.
	1914-15	1913-14	1914-15	1913-14	Ha.
Wheat	5,691,771	6,138,060	64,720,200	78,703,210	12.8
Rye	1,029,565	1,080,370	9,928,200	11,888,260	10.5
Barley	692,758	740,961	7,862,750	10,044,930	18.6
Oats	8,419,955	8,681,869	87,462,200	46,654,720	12.7
Corn	810,113	461,920	.....	.....	.....
Potatoes	1,802,561	1,479,690	.....	140,000,000	.....
Sugar beets	84,318	195,433	.....	.....	.....
Vines*	1,637,218	1,653,599	.....	59,981,492	.....

* Production in hectolitres of wine.

In the invaded area were 275,000 hectares under wheat in 1915, 24,000 under rye, 19,700 under barley, 243,000 under oats, 4238 under vines (1914).

In 1912, 33,133 hectograms of silk-worm eggs were placed to be hatched, against 35,431 hectograms in 1911. The cocoons obtained amounted to 6,233,942 kilograms, against 5,109,426 in 1911. Average yield of cocoons per hectogram of eggs, 188.1 kilograms (144.2 in 1911). Live stock statistics follow (Dec. 31, 1910 and 1913; July 1, 1915).

	1910	1913	1915
Horses	3,197,720	3,280,700	2,227,209
Mules	192,740	192,570	152,266
Donkeys	860,710	860,890	837,244
Cattle	14,532,080	14,807,380	12,286,849
Sheep	17,110,760	16,213,030	13,483,189
Goats	1,417,710	1,453,230	469,487
Swine	6,900,280	7,047,750	5,490,796

Of the horses enumerated Dec. 31, 1913, 2,558,170 were over and 672,530 were under three years (July 1, 1915, 1,562,742 and 664,467); of the cattle, 7,807,560 were cows (6,346,496), 1,845,620 oxen (1,262,315), 284,490 bulls (211,343), 2,855,780 young stock (2,581,870), and 2,013,930 calves (1,884,825). Of the sheep, 9,334,840 were ewes over one year (8,033,886), 2,589,000 sheep over one year (1,572,236), 295,410 rams (239,832), 3,993,780 lambs (3,637,235); pigs under six months numbered 3,294,

010 (3,041,053); fat stock over six months, 2,808,230 (1,632,252), sows, 960,000 (785,989).

MINING AND METALS. In 1912 there were 1459 conceded mines, covering an area of 1,166,353 hectares, of which 496, covering an area of 596,262 hectares, were in operation. In these mines 236,966 persons were employed—168,358 underground, 68,608 at the surface. Total estimated number of work days, 67,991,633; total estimated wages, 358,001,473 francs. Total output, 62,284,573 tons, valued at 775,403,262 francs at the pit's mouth. The quarries employed 134,087 work people; output, 53,279,845 tons, valued at 293,623,038 francs. In the table below are shown some of the principal mining products, with their value in francs, for comparative years:

	Tons		Francs	
	1911	1912	1911	1912
Coal	38,520,827	40,394,177	589,219,277	631,427,608
Lignite	708,764	751,001	7,229,739	8,001,683
Iron*	16,639,426	18,423,752	77,462,085	89,387,275
Peat	58,521	42,714	785,674	512,716
Salt	1,339,303	1,098,515	18,826,599	15,850,245
Gold*	143,514	165,880	7,588,080	9,574,000
Zinc ore	43,761	45,929	5,159,005	5,148,000
Iron pyrites	277,942	282,002	4,696,685	4,766,000
Argent. lead	14,098	13,953	2,612,959	3,790,000
Antimony	29,267	11,018	1,596,668	599,000
Asphalt	35,568	31,535	566,688	491,869
Manganese	6,036	5,576	169,564	178,000

* Ore.

Employed in metal works in 1912 were 5870 workpeople; output, 4,939,194 tons. Smelting works, 13,312 workpeople; 524,907 tons. Steel works, 72,653 workpeople; 3,250,278 tons.

FISHERIES. There were in 1911, 137,057 persons engaged in the various fisheries, with 28,885 vessels of 247,634 aggregate tons.

In 1910 there were 128,869 fishermen, with 28,288 sail boats of 206,129 aggregate tons, and 454 steamers of 38,000 tons; value of sail boats, 51,933,057 francs; of steamers, 23,945,330; value of the engines, 25,309,360. Total value of all fisheries products for the year 1910, 140,288,211 francs. The total value of the products was 139,568,367 francs, of which the Newfoundland cod fisheries contributed 19,015,063 francs, the herring fisheries 13,243,466, and the sardine fisheries 11,311,615.

COMMERCE. Imports for four years are given below by great classes (special trade), values in thousands of francs (A—foodstuffs, B—raw materials, C—manufactured articles):

Imports:	1910	1911	1912	1913
A	1,413,031	1,989,832	1,803,400	1,916,500
B	4,345,871	4,638,979	4,813,200	4,941,600
C	1,414,630	1,531,856	1,614,200	1,650,300
Total	7,173,332	8,160,667	8,230,800	8,508,400

Exports appear in the following table, by great classes as above, with the addition of D (by parcel post), values in thousands of francs:

Exports:	1910	1911	1912	1913
A	858,199	725,240	849,800	838,200
B	1,930,847	1,919,170	1,944,900	1,882,700
C	2,960,951	3,039,761	3,917,900	4,159,500
D	483,808	487,906	.....	.....
Total .	6,238,805	6,172,077	6,712,600	6,875,400

The figures for the 1913 special trade are subject to slight revision. The general commerce for 1912 shows imports valued at 10,293,600,000 francs, exports valued at 8,823,900,000 francs. An English source gives the 1914 trade as follows: £253,960,000 imports and £179,120,000 exports (exclusive of £13,880,000 by parcel post).

The table below shows important articles in the special trade for successive years, values in millions of francs:

Imports:	1908	1909	1910	1912	1913	1914
Wool	533.1	634.4	658.9	684.6	698.8	526.1
Cotton	358.9	494.7	469.8	567.1	541.2	356.3
Coal, etc.	361.2	442.1	400.7	501.4	575.2	441.6
Raw silk	845.2	831.5	346.3	567.1	541.2	258.9
Rubber	120.3	208.8	320.1	218.7	199.5	81.4
Cereals	221.3	152.9	301.3	366.8	613.4	564.5
Wines	102.5	123.8	296.5	321.0	275.6	240.7
Machinery	148.4	216.2	247.5	301.6	323.7	213.6
Skins, etc.	199.6	199.3	206.9	222.3	233.5	177.5
Timber	172.6	183.2	165.9	177.2	186.9	117.4
Copper	164.7	122.6	130.6	197.1	207.0	150.6
Coffee	101.8	112.3	126.4	216.9	224.8	208.2
Flax	87.4	81.2	82.4	114.7	122.9	75.5
Oil seeds	231.2	292.1	379.7	17.0	10.5	849.6
Petroleum .....	.....	.....	.....	144.9	144.9	125.6
Chem. products.	138.6	.....	.....	.....	138.6	106.5
Exports:	1908	1909	1910	1912	1913	1914
Raw wool	273.0	337.7	341.4	365.5	294.2	248.2
Silk	307.8	316.9	332.8	292.3	374.2	313.9
Cottons	306.7	332.0	328.2	384.7	367.4	276.9
Wines	196.9	214.4	243.3	223.8	200.3	132.6
Woolens	224.0	212.1	212.5	190.7	211.3	153.1
Raw silk	172.3	164.0	183.6	147.7	161.7	146.9
A. de P.*	184.0	178.3	172.7	184.6	190.8	130.3
Automobiles	137.9	146.6	161.9	207.1	217.5	130.3
Skins	153.1	141.5	133.7	321.2	315.7	117.1
Metals	114.8	99.1	102.4	118.8	125.0	84.5

* Articles de Paris.

Countries of origin and destination, special commerce, values in thousands of francs:

	Imports			
	1910	1911	1913	1914
U. K.	930,344	1,020,827	1,113,100	870,000
Germany	860,477	965,086	1,068,800	593,900
U. S.	614,123	883,138	894,700	787,600
Belgium	469,749	533,001	556,200	316,400
Algeria	446,643	457,540	330,800	312,800
Russia	337,325	412,641	458,100	311,200
Argentina	302,914	364,875	369,200	217,100
Spain	195,271	227,745	281,500	195,800
Italy	188,913	187,877	240,500	173,900
Brazil	167,166	155,061	174,200	160,500
Switzerland	138,912	142,153	135,200	101,900
Turkey	96,117	100,177	93,600	77,300
Aus.-Hun.	88,614	86,180	103,400	60,900
Other .....	.....	.....	.....	.....
Total	7,173,332	8,160,667	8,421,300	6,349,200

	Exports			
	1910	1911	1913	1914
U. K.	1,275,138	1,246,980	1,453,800	1,153,700
Germany	804,013	819,061	866,700	498,500
U. S.	456,039	869,595	422,600	375,700
Belgium	1,003,650	1,002,503	1,108,400	603,900
Russia	87,534	55,461	83,200	60,900
Argentina	162,843	171,917	199,900	93,300
Spain	140,655	137,610	151,200	111,400
Italy	344,194	288,274	305,700	213,500
Brazil	68,813	78,332	86,800	39,100
Switzerland	385,518	402,949	406,100	299,600
Turkey	72,927	82,156	83,200	72,500
Aus.-Hun.	45,961	46,208	43,800	32,000
Algeria	438,930	484,628	552,500	437,300
Other .....	.....	.....	.....	.....
Total	6,233,805	6,172,077	6,880,200	4,824,500

By presidential decree dated July 31, 1914, the export of all kinds of food flour has been prohibited from the day when the decree was communicated to the prefects. By presidential decree dated October 18th, the export of cotton and cotton waste has been prohibited from October 19th. Exceptions to these orders may, however, be granted.

By an order of Aug. 22, 1915, raw cotton was declared contraband of war.

SHIPPING. The number of ships, French and foreign, with their aggregate tonnage, entered and cleared, exclusive of coasting, during the years 1911 and 1912 are given herewith.

	1911		1912	
	No.	Tons	No.	Tons
Entered:				
French	7,690	7,138,790	8,093	7,581,374
Foreign	20,493	22,728,220	21,793	23,721,433
Total	28,183	29,867,010	29,886	31,302,807
Cleared:				
French	6,946	6,623,511	8,288	7,763,518
Foreign	13,860	15,931,835	21,766	23,709,449
Total	20,806	22,555,346	30,004	31,472,968

Merchant marine, Jan. 1, 1913: 15,813 sailing vessels, of 614,024 tons; 1857 steamers, of 904,494—total, 17,670 vessels, of 1,518,518 tons.

COMMUNICATIONS. There were reported in operation Dec. 31, 1913, 40,786 kilometers of main railway lines, and 10,645 of local lines. At the end of 1910 there were in operation 40,484 kilometers of main railway lines, 234 of industrial lines, and 8956 of local lines; making a total of 49,628 kilometers, besides 8687 kilometers of tramways. The main lines had a personnel of 339,032, and rolling stock including 12,840 locomotives and 379,181 cars. Receipts from main lines (1910), 1,829,942,000 francs; expenditure, 1,098,802,000; net profit, 731,140,000; net kilometer profit, 18,060. Length of main lines in operation in 1911, 40,635 kilometers; in 1912, 40,854. Length of local lines in operation in 1911, 9321; in 1912, 9925.

During 1915 the railways of France, except in the territory actually the scene of military operations, were restored somewhat to their normal conditions. The railway systems, both state and private, passed through the trials of the earlier stages of the war with considerable credit, notwithstanding the fact that the military organization of the French lines was in no way comparable to that of Germany. The French railroads performed a wonderful service, and were essential elements of the successful retreat and operations attending the battle of the Marne in 1914. Reports of their activity in the first months of the war, published in 1915, revealed the fact that from Aug. 1 to Aug. 20, 1914, no less than 1,800,000 men were taken to the front, and each of these soldiers was handled three times, so that in reality 5,400,000 troops were delivered at various points along the battle line. In addition, it was estimated that some 5,000,000 of the civilian population were also traveling, and that two armies were being hurried into Alsace and Lorraine. After the first two weeks of the war, except in the actual zones of fighting, the regular schedules for regular passengers and commercial freight practically were resumed, and were carried on in addition to the movement of large numbers of troops and war material, on

a battle front 584 miles long from the English Channel to the Swiss frontier. When it is recalled that the rolling stock was constantly decreasing, as well as the coal supply, and a smaller number of railroad men were available, the importance of the work may be appreciated.

France contains six large railway systems—two controlled by the state, and four by private corporations—the latter comprising 30,000 of the 36,000 miles of single track, and it was by these private companies that much of the work was done during the war. In addition to the mobilizing of the troops in the early part of the war, there was the transport of tourists, and on Aug. 1, 1914, the time tables on every one of the six systems of France were changed to a new schedule. One of the most notable incidents of the war was the transportation of 70,000 Indian troops from Marseilles in three days, from the south of France to the vicinity of Orleans, whence they proceeded to support the English at Nieuport-Dixmont. The French railways at first suffered from the effects of mobilization as in some cases employees were withdrawn, but gradually this trouble became adjusted, and in many instances the wives of railroad men called to the colors took their husbands' places.

The Eastern Railroad (chemin de fer de l'Est), with the single exception of the Northern Railroad (chemin de fer du Nord), suffered more physical and financial disaster than any other of the French roads, because of the German lines. At least half of the 500-mile line of trenches beginning at Laon was in the territory adjacent to the tracks of the Eastern Railroad, which was in consequence seriously crippled. On that half of its system which brought in the greatest revenue, it could do no business at all, and it was thought it would be many months after the cessation of hostilities before it could rebuild its burned stations, restore dynamited bridges, repair its roadbed, etc.

Likewise the Northern Railway (chemin de fer du Nord) suffered severely, as much of its territory was in the enemy's hands. At the beginning of September, 1914, only 414 miles, or 18 per cent of the total network of 2324 miles, was actually being operated by the company. At the end of 1915, the company was operating a total length of about 1200 miles, or 51.5 per cent of the entire system. Of the 768 stations on the system, 346 were either occupied by the enemy or closed to traffic. Not all the remaining 412 stations were open to the public, a certain number being exclusively reserved for military uses. For over a year the Nord was deprived of the use of most of its main lines, and the only double-track main line available at the end of 1915 was that from Paris to Creil, Amiens, Boulogne, Calais, and Hazebrouck.

In 1912 there were 190,111 kilometers of telegraph lines, and 710,557 of wires; state telegraph stations, 18,707; railway and private stations, 3577. There were 51,750 kilometers of urban telephone lines, with 1,135,953 of wires; and 108,447 kilometers of interurban lines, with 571,405 of wires. Post offices, 14,634. Postal receipts for the year 1912, 390,942,960 francs; expenditure (posts and telegraphs), 353,028,874 francs. Telegraphic receipts (including wireless), 49,347,920 francs. Telephone receipts, 56,649,228 francs.

FINANCE. The monetary unit is the franc, par

value 19.295 cents. The 1912 budget, as voted, estimated the revenue for the year at 4,495,849,566 francs (including revenue returnable from Algeria, 2,480,900 francs); the expenditure at 4,497,963,139 francs. Sources of revenue: 3,136,996,425 from taxes; 953,225,785 from monopolies and state industrial enterprises; 68,218,850 from state domains; 69,441,485 from divers sources (indemnities, repayments, annuities, sales, prison labor, etc.); 153,000,000 from special sources; 114,967,021 *recettes d'ordre* (from colonial railways, fines, fees, etc.); 2,480,900 from Algeria. Expenditure: 1,286,084,002 for the public debt, 19,972,948 for public services, 2,539,705,705 for the ministries, 605,873,584 for costs of administration and collection of taxes, 46,326,900 for reimbursement, restitution, etc.

Actual revenue and expenditure are given below in francs for three years:

	1910	1911	1912
Revenue . . .	4,273,890,789	4,689,045,845	4,857,491,193
Expend. . .	4,321,918,609	4,547,915,741	4,742,756,094

The details of the budget for 1914 are given below in thousands of francs:

Revenue	1914	Revenue	1914
Direct taxes . . .	607,485	Monopolies	1,004,858
Other direct . . .	68,037	Sundries	753,085
Indirect	2,940,050		
		Total	5,373,517

Expenditure	1914	Expenditure	1914
Public debt	1,318,324	Instruction	843,882
Government	19,859	Fine arts	21,816
Finance	379,839	Commerce, etc.	16,470
Justice	61,523	Labor, etc.	112,122
Foreign affairs	20,943	Posts and Tels.	857,786
Interior	177,421	Colonies	110,918
War	1,436,491	Agriculture	57,999
Marine	489,124	Public works	352,822
Merchant marine	96,032		
		Total	5,373,329

The special-services budget balanced at 816,329,331 francs for 1913. The total general debt, Jan. 1, 1913, stood at 31,449,083,037; floating debt, Oct. 1, 1913, 1,432,412,800; grand total, 32,881,495,837.

ARMY. See **MILITARY PROGRESS**, *passim*.

NAVY. On Dec. 1, 1912, the number and displacement of warships, built and building, of 1500 or more tons, and of torpedo craft of more than 50 tons, were as follows: 7 battleships (dreadnought type), having a main battery of all big guns (11 inches or over in calibre), of 161,644 aggregate tons—all building; 20 battleships (predreadnought type), with main batteries of more than one calibre, of 286,005 tons—built; 2 coast-defense vessels (smaller battleships and monitors), of 15,400 tons—built; 10 cruisers (designed for speed at some expense of armament and armor protection), of 49,978—built; 75 torpedo-boat destroyers, of 29,816 tons—built, and 9, of 6860 tons—building; 157 torpedo boats, of 15,370 tons—built; 76 submarines, of 27,803 tons—built, and 13, of 7456—building. Total vessels built, 361, of 630,769 tons; building, 29, of 175,960 tons—in all, 390 vessels of 806,729 tons. Excluded from the foregoing are ships over 20 years old, unless reconstructed and rearmed within 5 years; torpedo craft over 15 years old; transports, colliers, repair ships, torpedo depot ships, or other auxiliaries. Personnel, 60,188 officers and men.

Number and displacement (built), July 1,

1914: 4 battleships (dreadnought type), of 92,368 tons (and 8, of 193,656 tons estimated, building); 18 battleships (predreadnought type), of 262,675 tons; 1 coast-defense vessel of 8800 tons; 20 armored cruisers, of 201,724 tons; 9 cruisers (unarmored warships of more than 1500 tons), of 46,095 tons; 84 torpedo-boat destroyers, of 35,812 tons (and 3 of 2563 tons, building); 135 torpedo boats, of 13,426; and 64 submarines, of 27,940 tons (and 22, of 14,766 tons, building). Total number of vessels built, 335, of 688,840 aggregate tons; building, 33, of 211,075 tons—a total of vessels built and building, 368, of 899,915 tons. The total strength of the personnel, including reserves, was about 180,000, one-third being active-service ratings. The general efficiency increased noticeably from 1904 to 1914. The main squadrons were concentrated in the Mediterranean under the command of Admiral Boué de Lapeyrère. The armored-cruiser fleet included the *Edgar Quinet* and the *Waldeck Rousseau*, completed in 1911, and having a displacement of 13,900 tons, and an armament of 14 7.6-inch guns. The submarine service is highly efficient, the vessels composing it being remarkable for their heavy armament. Air craft, April 7, 1913, included 13 military dirigibles on hand and 7 ordered; and 450 military aëroplanes on hand, including monoplanes, biplanes, and hydroaëroplanes.

A bill passed Feb. 13, 1912, by the Chamber of Deputies, provided for a home fleet to consist of 28 battleships divided into 4 squadrons each and 4 vessels in reserve; in addition, each squadron to include 2 second cruisers and 12 destroyers, with 2 cruisers and 4 destroyers in reserve. The fleet for foreign service was to contain 10 principal vessels with the necessary auxiliaries. There were to be 94 vessels, together with mine-layers and mine-raisers, in the submarine flotilla. To complete this programme by the time fixed (Jan. 1, 1919), 16 new battleships were to be constructed at the rate of two a year (1910-17). Dreadnoughts laid down in 1913 were the *Flandres*, *Gascogne*, *Languedoc*, *Normandie*, and *Béarn* (the latter 1914). These ships are to displace 25,800 tons and be armed with 12 13.4-inch and 24 5.5-inch guns. The three battleships launched in 1913 are the *Lorraine*, *Bretagne*, and *Provence*, having a displacement of 23,177 tons and armed with 10 13.4-inch and 22 5.5-inch guns. The *Jean Bart* and the *Courbet* were completed in 1913, having a displacement of 23,096 tons, and being armed with 12 12-inch and 22 5.5-inch guns. The *Paris* and the *France* were completed in 1914. The *Vendée* was to have been laid down early in 1915. See also NAVAL PROGRESS.

GOVERNMENT. Under the present constitution, the President is the executive, assisted by a cabinet responsible to the Chamber. The legislative power is vested in a Parliament, or National Assembly, composed of a Senate and a Chamber of Deputies. The President elected by the National Assembly by an absolute majority of votes for seven years, chooses his own cabinet, ordinarily, but not of necessity, selected from among the members of the two chambers. The Senate is made up of 300 members aged not less than 40 years, and elected by delegates for nine years; the Chamber of Deputies is made up of members elected by direct popular vote for four years, 1 to every 70,000 inhabitants. The president from 1906 to 1913 was Clément-Armand Fallières; he

was succeeded Jan. 7, 1913, by Raymond Poincaré, born 1858.

HISTORY

OPENING OF THE PARLIAMENTARY SESSION. After five terrible months of the war, the French people and the French government showed no sign of weakening in their steadfast determination to fight on until the German invader had been expelled and the lost Provinces of Alsace-Lorraine regained. Although events had proved that the war would be long and victory costly, the same grim "will to conquer" which had been expressed in August, 1914, prevailed in France at the beginning of the new year. President Poincaré, in a New Year's address, confidently affirmed that France would never rest until victory was won; he even ventured to predict that the war would be pressed to a successful conclusion before the close of the year 1915. The establishment of civil government, Jan. 1, 1915, in the portion of Upper Alsace occupied by the French was another manifestation of the same spirit of optimism. When the Chamber of Deputies and the Senate assembled for the legislative session of 1915, new proof was afforded of the patriotic unanimity of the nation's representatives. The Socialists, who had hitherto made it a practice to nominate a separate list of candidates for the presiding officers of the Chamber, decided in January, 1915, to abandon their custom and to unite with the other groups in re-electing, by an almost unanimous vote, M. Paul Deschanel as president of the Chamber of Deputies. M. Antonin Dubost was re-elected as president of the Senate. In their inaugural addresses, both presiding officers praised the *union sacrée*, the willingness of all parties to forget their political antagonisms and to work for the triumph of France. The tasks incumbent upon the National Legislature in war-time were admirably summed up by M. Deschanel. The Chambers, he said, must strive "to aid those who are at the front as well as the families left behind; to repair damage done by the invader; to collaborate, according to the measure of their authority, in the work of defense; and to join with the nation and the government in attempting to achieve the expulsion of the enemy, the deliverance of the heroic country (Belgium) which by an act unique in history sacrificed itself to honor, and the restitution of those provinces which force has wrenched from us. At the same time, we must, during the war, prepare for the works of peace; beginning to-day we must establish the elements of to-morrow's economic régime—customs, transports, mines, credit, industry—and of national reconstitution; we must lay the basis for the new France, more fraternal and more prosperous than before."

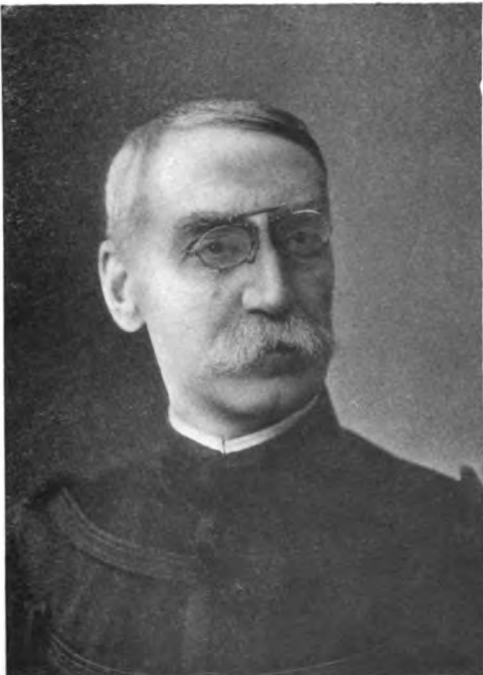
FINANCIAL QUESTIONS. Old political controversies being for the time forgotten, the Chamber of Deputies during the spring concerned itself chiefly with special measures for the relief of suffering caused by the war, for the regulation of industry, and the conservation of the nation's economic resources during war-time, and for the provision of funds for the energetic prosecution of the war. French industry had been crippled by the German occupation of very important industrial areas; business was conducted under abnormal conditions, as the moratorium had been prolonged; nevertheless France had not only to defray her own enormous expenses in the war,



THÉOPHILE DELCASSÉ
Minister of Foreign Affairs, 1914-October 13, 1915



ARISTIDE BRIAND
Premier and Minister of Foreign Affairs from October 29, 1915



GENERAL GALLIENI
Minister of War



RENÉ VIVIANI
Premier until October 28, 1915, thereafter Minister of Justice

FOUR FRENCH STATESMEN

but also to make joint loans with Great Britain to Serbia, Belgium, Greece, and Montenegro. The expenditures during the first months of 1915, according to a statement made by M. Alexandre Ribot (minister of finance) on March 18th, amounted to almost 1,300,000,000 francs a month. The Bank of France had been called upon in 1914 to furnish 3,600,000,000 francs, and in 1915, thus far, 1,000,000,000. The amount raised by public subscriptions in 1914 was only 1,200,000,000; in less than three months in 1915, a sum more than twice as great had been raised. Altogether the national defense bonds had produced 3,862,000,000 francs up to March 12.

MINIMUM WAGE FOR THE SWEATED TRADES. The miserable conditions usually prevalent in the sweated trades were aggravated by the war, since many poor women, whose husbands had been sent to the front, found it necessary to earn their own livelihood and swelled the number of underpaid workers in the clothing trades. To remedy this evil, the Chamber of Deputies passed a bill modifying the Labor Code and establishing the principle of a minimum wage for certain categories of women workers. According to the statement of M. Jean Morel, who made a remarkable report on the bill in the Senate, the minimum wage regulation would affect about a million women wage-earners, many of whom had been receiving less than 20 centimes an hour for their labor.

THE DESCLAUX GRAFT CASE. In March a profound sensation was created by the Desclaux trial. Instances of dishonesty on the part of officials and contractors in connection with the provision of supplies for the army were probably no more numerous in France than in other countries, but in France such cases aroused public indignation to a greater degree, because among the swindlers who defrauded the government were men who had recently held important administrative positions under the Radical-Socialist government. The most conspicuous offender was a former paymaster-general of the French army, François Desclaux, who had been identified with the Radical-Socialist faction and had been chief secretary to M. Joseph Caillaux during the latter's term of office as finance minister, in 1914 (see *YEAR BOOK for 1914, FRANCE, Murder of M. Calmette*, p. 269). In January, 1915, M. Desclaux was arrested on the charge of stealing army supplies. Mme. Bechoff, a prominent Parisian dressmaker, was implicated in the case, and quantities of the stolen goods—coffee, tents, shells, and helmets—were found in her home. Two months later, M. Desclaux and Mme. Bechoff were convicted after trial by court-martial, M. Desclaux receiving a sentence of seven years' solitary confinement; Mme. Bechoff, two years' imprisonment; and a soldier-accomplice, M. Verges, one year. Desclaux appealed from the decision of the court-martial, but was unable to secure an acquittal, and was degraded from his military rank, August 2nd. The Desclaux case was by no means an isolated incident. In December the fact was revealed that M. Thierry, under-secretary of war, had been a director of a firm, La Morue Française, which had sold a quantity of chemically-preserved codfish to the government at an outrageous price. Many other cases of corrupt dealing in the provision of war supplies were exposed by M. Simyan, in a speech before the Chamber of Deputies, December 14th.

ATTACKS ON THE WAR MINISTRY. During the

summer a few deputies and certain Parisian journals vigorously assailed the administration of the war department. In the Chamber, June 24th, a Radical-Socialist deputy, M. Léon Accambray, violently censured the minister of war, M. Millerand, for having failed to prevent or correct grave defects in the manufacture of shells and in the organization of the sanitary service. Again, on August 5th, after a most eloquently patriotic speech had been delivered by M. Deschanel, M. Accambray attempted to voice virulent criticism of the minister of war. M. Accambray on this occasion obviously failed to gain the sympathy of the Chamber, the overwhelming majority of which was keyed to the highest pitch of patriotic enthusiasm by the reading of President Poincaré's message. The army, said M. Poincaré, realized that "on the victory of France and the Allies rests the future of civilization and humanity. . . . Those who fall die without fear, since by their death France lives and will live forever. . . . In the error of its arrogance, Germany has represented France as light, impressionable, unstable, and incapable of perseverance and tenacity. The people and the army of France will continue to controvert this calumnious judgment by their calm conduct." The storm of criticism had not yet blown over, however. M. Clemenceau, writing in his journal, *L'Homme enchaîné*, continued to discover flaws in the war department. In the Chamber of Deputies, August 13th, M. Brizon vehemently praised General Sarrail, who had been recently removed from his important command in France and transferred to the distant Dardanelles. General Sarrail, it may be noted, was regarded as a possible successor to General Joffre and was praised by Radicals and Socialists as a better "republican" than the commander-in-chief. In reply to the criticisms which had been directed both against himself and, by implication, against the generalissimo, M. Millerand intervened, August 20th, in the debate on an appropriation for the payment of two additional under-secretaries of war, and declared: "For a week certain deputies have conducted here a trial of the war minister. According to them my administration has been characterized by negligence, inertia, and carelessness; I am a prisoner in my own office; I have abdicated in favor of the military authorities and am an enemy of parliamentary control." M. Millerand admitted frankly that the sanitary service at the outset had been faulty; but he asserted that the defects had been remedied, that the supply of munitions had been accelerated in a most satisfactory manner, and that the commander-in-chief enjoyed the complete confidence and admiration of the government, the army, and the nation. The Chamber then adjourned to August 26th. During the short recess, a petition was presented by notable publicists in favor of a modification of the censorship of the press; among the signers of the petition were Gabriel Hanotaux, Stephen Pichon, the editors of the *Temps*, of the *Journal des débats*, of the *Figaro*, and of the *Gaulois*, and M. Georges Clemenceau, whose criticism of the government was mentioned in a foregoing sentence. The test of the government's strength came in the sitting of August 26. Many observers expected the Chamber of Deputies to insist upon the creation of a secret committee to investigate the conduct of the war department. M. Accambray repeated his attacks on M. Millerand. But the president

of the council, M. Viviani, defended the government in a stirring speech, and the Chamber of Deputies with only one dissenting voice granted the credits for which the government had asked. The Chamber was thereupon adjourned to September 16.

THE COST OF THE WAR. Finance monopolized the attention of the Chamber in September. The budget for the remaining three months of 1915, as drafted by Finance Minister Ribot, contemplated an expenditure of 6,240,000,000 francs. Russia, M. Ribot declared, was spending 1,800,000,000 francs a month; Germany, 2,500,000,000 francs; and Great Britain, an even larger sum; whereas the average monthly expenditure of France would amount to less than 2,100,000,000 francs. The three-months' appropriation was quickly passed by the Chamber of Deputies and received the approval of the Senate, September 28th, making the total of appropriations since Aug. 1, 1914, more than 28,000,000,000 francs.

DELCASSÉ'S RESIGNATION. The failure of the Allies' diplomacy in the Balkans, culminating in the Austro-German-Bulgarian invasion of Serbia (consult **WAR OF THE NATIONS**), entailed as one of its consequences the resignation of the French foreign minister and the overthrow of the Viviani cabinet. M. Viviani's explanation of the Balkan situation was published in the French papers, October 13th. That night M. Delcassé, the foreign minister, sent a letter to M. Viviani, announcing his resignation. The following morning, M. Viviani called a special meeting of the council of ministers and explained that M. Delcassé, who had previously asked to be relieved of his arduous ministerial duties, on the ground of ill-health, now insisted upon resigning, since he could not agree with the government on the question of aiding Serbia. In the afternoon of October 14th, the president of the council informed the Chamber of Deputies that the foreign minister had resigned, but denied that any divergence of opinion had manifested itself between M. Delcassé and the other members of the cabinet. Further information regarding the government's plans for the relief of Serbia were insistently demanded by M. Painlevé, who dwelt with great emphasis on the importance of preventing the Germans from opening up the road to Constantinople, and practically demanded that the government reveal the size of the forces sent to Saloniki. M. Viviani, however, would vouchsafe no other information, and limited himself to asserting that in sending the force to Saloniki, the government had taken care not to weaken the front in France. M. Renaudel, a Socialist, reproached the government for its slowness of action and demanded a secret committee to investigate the matter. M. Viviani announced that he would regard the vote on this question as an indication of the Chamber's confidence in the government. The demand for a secret committee was then rejected by 303 to 190, and a vote of confidence was passed, after a tumultuous discussion, by a majority of 372-9. More than 150 deputies abstained from the vote, as an indication of their lack of confidence in the cabinet. Since he could no longer command the unanimous confidence of the Chamber, M. Viviani tendered his resignation to President Poincaré, October 29th.

THE BRIAND CABINET. A new cabinet was formed by M. Briand, October 29th; its membership, as announced October 31st, was as fol-

lows: President of the council and minister of foreign affairs, M. Aristide Briand (not inscribed in any of the groups of the Chamber, but leader of the Federated Parties of the Left: consult the **YEAR BOOK** for 1914, p. 269); ministers of state, without portfolio—M. de Freycinet (Senate, independent), M. Léon Bourgeois (Senate, Democratic Union), M. Emile Combes (Senate, Democratic Union), M. Jules Guesde (Unified Socialist), M. Denys Cochin (Right); justice, M. René Viviani (Republican-Socialist); war, General Galliéni; navy, Admiral Lacaze; finance, M. Ribot (Senate, Republican Union); interior, M. Malvy (Radical-Socialist); public instruction and fine arts, M. Painlevé (Republican-Socialist); commerce, M. Clémentel (Radical Left); agriculture, M. Jules Méline (Republican Left, Senate); public works, M. Marcel Sembat (Unified Socialist); labor, M. Albert Métin (Radical-Socialist); colonies, M. Doumergue (Senate, Democratic Union). M. Jules Cambon, as delegate of the minister of foreign affairs, was an important auxiliary of the new cabinet. It is interesting to note, furthermore, that since the outbreak of the war, under-secretaryships for munitions, sanitary service, aviation, and intendance had been created in the war department; the new posts were filled by M. Albert Thomas (Unified Socialist), M. Joseph Thierry (Democratic Union), M. Justin Godart (Radical-Socialist), and M. René Bernard (Radical-Socialist), respectively. The most important features of the Briand cabinet were: first, the inclusion of a representative of the Right, M. Denys Cochin; second, the fact that eight of the new ministers—MM. Briand, de Freycinet, Bourgeois, Combes, Méline, Ribot, Doumergue, and Viviani—were former presidents of the council; third, that the fighting departments, the navy and the army, were placed in charge of professional warriors, Admiral Lacaze assuming control of the navy, and General Galliéni, who had rendered brilliant service as military governor of Paris, superseding the much-criticised Millerand in the ministry of war. On November 3rd, M. Briand made his declaration of policy before the Chamber of Deputies. He promised to improve the censorship; he assured the Chamber that the government would communicate to it all the information to which the Chamber was entitled; he declared that France and her Allies would not abandon "heroic" Serbia; and he warned the enemies of France that they could not expect "either weariness or exhaustion" on the part of France. As for the terms of peace, he declared, "when the territory of France shall have been wrested from the invader, when the peoples who have been martyred for us, among whom Serbia must be included, have been restored integrally to their rights, then there will be a question of peace." A Socialist, M. Pierre Renaudel, attempted to heckle the new government, demanding a secret committee to investigate the conduct of the war, and inquiring why Socialist papers were excluded from the trenches. M. Renaudel created a lively sensation, and evoked some vehement protests when he insisted that France should repudiate all ideas of acquiring new territory by the war, and asserted that the consciousness that they were not fighting for territorial conquests was a moral asset to the French army. The debate on the declaration of policy was wound up by the president of the council with an eloquent appeal for unanim-

ity. By 515 votes to 1 the Chamber of Deputies signified its confidence in the cabinet; 25 deputies, notwithstanding M. Briand's appeal, abstained from the vote.

POLITICS AND THE HIGH COMMAND. In course of the year a number of generals in the French army were superseded by younger men, and a few very important transfers and new appointments were made. The popular General Sarrail, for example, was transferred from his command in France to the Dardanelles. Admiral Dartige du Fournet replaced Vice-Admiral Boué de Lapeyrière in command of the naval forces. A still more significant change, however, occurred in December. On December 2nd a decree was issued entrusting General Joffre, who had hitherto been in command only of the armies in France, with the supreme command of all French military forces, excepting those in the colonies and in northern Africa. The purpose of the appointment, explained General Gallieni, was to secure "unity of direction" in the prosecution of the war. Some critics interpreted the decree as a triumph for General Joffre, who would now be able to control and supervise the French operations in the Dardanelles and in Serbia as well as in France. M. Georges Clemenceau, however, in his *L'Homme enchaîné*, and M. Gustave Hervé, in *La Guerre sociale*, hinted that General Joffre was being honored with a nominal promotion, in order that the actual direction of the campaign in France might be given to another. On December 9th M. Emile Constant in the Chamber of Deputies questioned the government in regard to the high command. When M. Briand refused to take the Chamber into his confidence in the matter, M. Charles Chaumet declared: "It seems that you have taken too literally the witty paradox of M. Marcel Sembat, 'give us a king or give us peace.' It has appeared to you that there was some incompatibility between democracy and the state of war. We are persuaded, for our part, that the strength of democracy is to remain true to its principles." In the vote that concluded the interpellation, M. Briand was upheld by a majority of 443 to 98. Two days later an announcement was made which seemed, in some measure, to justify the predictions of M. Clemenceau and M. Hervé. Gen. de Currières de Castelnau was appointed to the newly created post of chief of the general staff. General de Castelnau had brilliantly commanded the second army in Lorraine during the earliest stage of the war; subsequently he had been placed in command, first of the army of the Somme, and then of the group of armies in the centre of the French battle line; it was he who had directed the French offensive movement in the Champagne region during September and October, 1915. See **WAR OF THE NATIONS**.

FINANCE. In the middle of December the Chamber of Deputies and the Senate were called upon to vote credits sufficient to cover the estimated expenditures for the first three months of 1916. Minister of Finance Ribot made the statement that France was spending approximately 2,100,000,000 francs a month, as compared with 1,500,000,000 francs in the first months of the war. According to the calculations of the appropriations committee of the Chamber, the total expenditures of France from Aug. 1, 1914, to Dec. 31, 1915, amounted to 31,024,000,000 francs. More than three-fourths of this sum, or 24,347,000,000 francs, had been disbursed for purely

military expenditures. The loans which had been issued to supply the stupendous sums needed for the war had been received by the French public in a highly satisfactory manner; General Joffre had urged his soldiers to persuade their friends and relatives to invest in the "loan of victory"; and the offices opened to receive subscriptions to the loan had been thronged by patriotic investors.

THE CLASS OF 1917. The determination of the French government to utilize every resource, hesitating at no sacrifice of money or of men, until victory was assured, found new expression at the close of the year 1915, when the ministry introduced a bill into the Chamber of Deputies providing for the immediate enlistment of 400,000 recruits who, under normal circumstances, would not have been called to the colors until 1917. Certain deputies, notably MM. Turmel and Auriol, demanded that before authorizing the government to call out the class of 1917, the Chamber should appoint a committee to investigate the utilization of the resources already at the government's disposal, or that at least the government should inform the Chamber of the number of recruits already incorporated in the army. A minority of 112 deputies supported this demand, but the majority upheld the government. In the course of the ensuing discussion, Lieutenant-Colonel Driant, reporter of the bill, assured the Chamber that the health of the young recruits would be carefully protected; that their barracks would be new, clean, and amply ventilated; that they would receive an extra supply of bread and meat and hot soup, besides wine, with their rations. M. Driant demanded, and obtained, one concession from the government, that the date for the enlistment of the new class be postponed from Dec. 15, 1915, to Jan. 5, 1916, in order to permit the youths to spend their Christmas holidays at home. General Gallieni, the war minister, informed the Chamber that although it was deemed necessary to call up the class of 1917, the boys would not necessarily be used in the trenches for some time to come. "I am asking you to call up the class of 1917," he said; "it is necessary that this class of recruits shall be prepared for the moment when the intensive production of armaments and of munitions, together with the reinforcement of the battle-line with new masses of men, may permit new and decisive efforts." Responding loyally to General Gallieni's appeal, the Chamber passed the bill unanimously. In the Senate the bill was passed on December 27th.

Consult also **INTERNATIONAL PEACE AND ARBITRATION**, and **WAR OF THE NATIONS**.

FRANCHISE, MUNICIPAL. See **MUNICIPAL GOVERNMENT**, *Model City Charter*.

FRANK, LEO M. See **GEORGIA**, *Politics and Government*.

FRATERNAL ORDERS. See **INSURANCE**.

FREE BAPTISTS. See **BAPTISTS**, **FREE**.

FREEMAN, HENRY BLANCHARD. American soldier, died Oct. 15, 1915. He was born in Mount Vernon, Ohio, in 1837. At the age of 18 he enlisted in the tenth United States infantry, in which regiment he was a first sergeant at the outbreak of the Civil War. A few months later he was promoted to the rank of second lieutenant, and shortly after, captain. He was brevetted for gallantry in the battle of Murfreesboro and later received the same honor as major in the battle of Chickamauga, where he was

taken prisoner and sent to Libby Prison. He escaped, but was recaptured, and escaped a second time. He was among several prisoners who tunneled their way out of this prison. After the close of the Civil War he took part in many campaigns against the Indians. Among these was the Sioux War of 1867-68. He was in the campaign in which General Custer lost his life. In 1870 he assisted in subduing the Ute Indians in Colorado. He took part in the Spanish-American War, as colonel of the twenty-fourth infantry; was made brigadier-general in 1901; and in the following year was retired under the age limitation. He received the Congressional Medal of Honor in 1894 for gallantry in the battle of Stone River. His last active service was in Cuba and in the Philippines.

FRENCH, SIR JOHN DENTON PINKSTONE (1852—). A British soldier, born at Ripple Vale, Ripple, Kent. From 1866 to 1870 he was a naval cadet and midshipman in the royal navy. He entered the army in 1874; served during the Sudan campaign (1884-85). From 1893 to 1894 he was assistant adjutant-general of cavalry, and from 1895 to 1897 was assistant adjutant-general at army headquarters. He was appointed major-general in command of the cavalry division in Natal in 1899. In 1900 he became lieutenant-general (local) of the cavalry division in South Africa. He commanded the cavalry in the operations terminating in the relief of Kimberley (February, 1900), and in the operations leading to the capture of Bloemfontein and Pretoria. He was promoted to be lieutenant-general and was appointed to the command of the 1st army corps at Aldershot. He became general in 1907, was inspector-general of home forces in 1907-11, and was made field-marshal in 1913. In March, 1914, during the controversy between Asquith's cabinet and the army over the army's service in Ulster, French resigned, but upon the outbreak of the great war later in the year he reentered the army and commanded the expeditionary force in France. In December, 1915, he was succeeded by Sir Douglas Haig (q.v.). He was made commander-in-chief of the home forces and was elevated to the peerage. See **WAR OF THE NATIONS**.

FRENCH ACADEMY. See **ACADEMY, FRENCH**.

FRENCH CONGO. Now French Equatorial Africa (q.v.).

FRENCH EQUATORIAL AFRICA (formerly French Congo). A French possession in equatorial Africa, on the west coast, composed of the Gabun Colony (capital, Libreville), the Middle Congo Colony (Brazzaville), and the Ubangi-Shari-Chad Colony (Bangui). From the old area of 669,280 square miles must be deducted, roughly, 170,270 square miles ceded under the convention of Nov. 14, 1911, to Germany by France; and to it must be added about 6450 square miles ceded to France by Germany from the Kamerun. The area ceded to Germany carries a population of about 1,000,000 out of the original 10,000,000 (the estimated population in 1906). These estimates of population are probably much too high. The products and export are rubber, ivory, timber, palm kernels and oil, cacao, etc. Gold, copper, and iron are mined. Imports (1913), 21,181,678 francs; exports, 36,665,037 (11,119,319 and 17,453,933 in 1909). Revenue and expenditure balanced (1911) at 15,263,000. Debt (Jan. 1, 1912), 14,-

784,215 francs. French Equatorial Africa is under a Governor-General resident at Brazzaville.

FRENCH ESTABLISHMENTS IN OCEANIA. A French colony in the South Pacific, consisting of widely scattered groups and single islands. Area (estimated), 3998 square kilometers; population, 31,477. Capital, Papeete (3617 inhabitants), in Tahiti. Imports and exports (1913), 9,030,474 and 11,554,507 francs respectively (5,659,367 and 6,031,289 francs in 1910). The principal exports are copra and vanilla.

FRENCH GUIANA (CAYENNE). A French colony and penal settlement on the northern coast of South America. It covers 88,240 square kilometers (34,069 square miles) and had a population in 1911 of about 49,000. Cayenne, the chief town and only seaport, has about 13,500 inhabitants. Gold-mining (placer) is the chief occupation of the people. Imports and exports in 1913 were valued at 12,494,765 and 12,222,537 francs respectively (12,233,000 and 11,567,000 francs in 1910). Of the value of the exports, about five-sixths is gold.

FRENCH GUINEA. A French West African colony. Capital, Konakry, with 6623 inhabitants; Kankan is the chief commercial centre. Other towns are Boké, Kindia, and Dubreka. The railway from Konakry to Kouroussa (588 kilometers) was completed and in operation Jan. 1, 1911. A branch to Kankan was to have been completed in 1914. Transport from and into the interior is by caravan, the best porters being Soussous and Malinkés. The route from Konakry to the Niger, known as the Leprince route, is via Kindia, Timbo, and Kouroussa. Rubber is the principal export, and is gathered over all the colony; but the principal sources are the Futa-Jallon, the Farana region, and certain circles of Upper Guinea. Rice is grown, and grazing is widely practiced. The mineral resources are believed to be considerable. See **FRENCH WEST AFRICA**.

FRENCH INDIA. Five French dependencies in India, covering 513 square kilometers, with 277,723 inhabitants in 1906 and 282,472 in 1911. Density per square kilometer (1906), 541.4. The towns are Pondicherry (the capital), Karikal, Mahé, Chandernagor, and Yanaon. The imports and exports (1913) were valued at 10,837,115 and 43,720,095 francs respectively (8,351,443 and 37,466,013 francs in 1910). Chief exports, oil seeds, raw cotton, and pulse. Railway from Pondicherry to Villapuram and Peralam to Karakal, 30 kilometers.

FRENCH INDO-CHINA. A dependency of France in southeastern Asia, made up of five states and a strip of territory leased from China, as follows:

	Sq. kms.	Pop. 1911	Pop. 1906
Annam	159,890	5,542,822	5,513,681
Cambodia	175,450	1,487,948	1,193,584
Cochin-China ...	56,965	3,050,785	2,870,514
Laos	290,000	631,839	5,896,510
Tongking	119,750	6,117,954	663,727
Kwangchow-Wan*	1,000	158,881	177,097
Total	†803,055	16,990,229	16,815,063

* Leased territory. † 810,060 square miles.

Hanoi (in Tongking) is the capital, with (1911) 113,676 inhabitants; Cholon had 191,665; Bin-Dinh, 75,000; Saigon, 72,000; Pnom-

Penh, 54,621; Hué, 65,000; Vien-tiane and Haiphong, each 27,000.

Trade statistics are returned for the colony as a whole, and are given below in francs:

	1909	1911	1913
Imports	249,753,877	244,143,000	306,288,068
Exports	273,084,618	250,147,000	345,259,253

The general budget balanced for 1913 at 35,608,395 francs; the budget of Tongking at 8,226,710; Annam, 3,976,980; Cambodia, 4,803,000; Cochín-China, 7,181,737; Laos, 928,691; Kwangchow-Wan, 296,022; total, 61,023,535. Debt (Jan. 1, 1912), 245,912,508 francs.

The railway from Saigon to Mytho (the oldest railway in the country) is being extended to Cantho (80 miles). Other lines are the Haiphong-Laoki-Yunnanfu (291 miles), the line from Hanoi to the Chinese frontier (308), Tourane-Hué-Quang-tri and Tourane-Paffu (130), Saigon-Khat-Hoa-Langbian (183). The Yunnan Railway was completed in 1910. The total length of railway reported at the end of 1914 was 1270 miles.

FRENCH LITERATURE. Naturally war was the supreme preoccupation in literature as elsewhere. As compared with the last months of last year, the only difference, if any, would be that the same views were expressed in soberer tone. The confidence as to the outcome of the war remains absolute. This present state of mind of the French people is in keeping with the steady tendency of recent years, as previously pointed out in the YEAR BOOK, away from dilettantism, æstheticism, skepticism, and cynicism, and towards nationalism, socialism (in the broadest sense of the term), and catholicism.

DRAMA. One by one the theatres have opened their doors again; by the end of the year many ran almost normally, except that they produced only a very limited number of new plays, depending on *reprises* like Sardou's *Patrie*, Bornier's *La fille de Roland*, and Kistemaeker's *La Flambee*. For the new plays the place of honor belongs to Maurice Barrès's *Colette Baudouche*, put on the stage early in the year—the story of an Alsatian girl who makes plain why, after 40 years of annexation, there can still be no real sympathy between the conqueror and the conquered. Two plays were inspired directly by events of the war; and neither was very well received. Clearly people did not like to see the villainy of the enemy put on the stage with stark realism, craving plays which would lift them up, not weigh them down. One of the two plays referred to is Nozière's *Prière dans la nuit*. There a loyal French woman of the invaded territory married a naturalized German; discovered that she had given her love to a traitor; and stabbed him before he had time to do more harm. The other is *La Kommandatur*, by Fronson, the Belgian author of the famous *Melle Beulemans*. It is a painful description of the conditions in Brussels under German rule, and especially the story of a German who has been refused the hand of a Belgian girl, returns to Brussels with the German army, takes a cowardly vengeance by having the fiancé of the girl shot, tries to force her to yield to him, and is stabbed for his pains. Plays which dealt with the sacredness of the French cause rather than with hatred of the enemy proved more acceptable. One is a short mystery, by Paul Claudel, the author of *L'Assommoir*.

nonce faite à Marie, called *La nuit de Noël 1914*. Another is an allegorical play by A. Villery, *La Vierge de Lutèce*, four acts celebrating Sainte Geneviève who saved Paris from Attila and the savage Huns—an allusion to modern events which was clear to all. Late in the year the Théâtre Sarah Bernhardt scored a great success with two short plays. The first performance of them was a welcome back to the stage for the divine Sarah, after her operation. *L'Impromptu du Paquetage* is a charming sketch by Maurice Donnay. The stage represents an office for war-relief in Paris, to which come various callers from the humbler classes and tell their touching tales, often heroic, of self-sacrifice on the altar of the mother-country. The other play, *Les Cathédrales*, is more spectacular. In a gray cloud, five religious sisters, representing the cathedrals of the five French regions, are bemoaning the tragic events of the war. Maledictions against the barbarians and prophecies of divine punishments are also heard, uttered with all the passion at the command of Madame Sarah Bernhardt's voice. The Comédie Française, the national theatre of France, offered patriotic matinées in which scenes of French history were revived, the actors of the famous house impersonating famous men and women. The matinée devoted to the French Revolution was one of the most successful.

POETRY. The times favor lyrical production. The newspapers and *revues* publish many poems inspired by the various phases of the war. Some are in a lofty epic vein, some tragic, some satirical and directed against the representatives of German *Kultur*, some cursing the monarch who dares to claim the God of Christianity as a sponsor for the atrocious deeds of his invading army, while others laud the heroism of those engaged in the gigantic struggle or serving at home as women and children can. Few betray the rhetorical and excited tone of J. de Marthold's "Chant de Haine," which he felt called upon to write as a retort to Lissauer's famous German "Song of Hate Against England." A fairly representative collection of war lyrics will be found in *Les Poètes de la Guerre* (Levrault). The real *chansonnier* of the war in France is Botrel, who is already well known for his exquisite songs of French Brittany, and who, by composing war songs in the trenches, has earned the titles "Barde de l'Armée," or "Lauréat des Tranchées," and "Singer of Rosalie"—"Rosalie" being the nickname the French soldiers give their bayonets. His *Chants du Bivouac* will be followed by the *Chants de Route*. There should be noted also: certain of Verhaeren's poems (see, e.g. his "La ferme des marais d'or," in *Grande Revue*, June); Claudel, *Trois Poèmes de Guerre*; Rostand, "Poem to America" (in *L'Illustration*); Le Coq, *Les Germaniades*; *oua; leurs crimes*; Lieut. George Rollin, *Sous la Cuirasse*.

FICION. From Capitaine Détanger, author of *Gens de Guerre du Maroc*, killed in action, September, 1914, came this year, posthumously, *Le Conquérant, Journal d'un indésirable au Maroc*, under the pseudonym E. Nolly. It is a colonial novel telling of a rich young man who has enjoyed life, and is ruined, but who resolves to turn a new leaf in Morocco, where he joins the Légion étrangère, and redeems his past by a glorious death. From no less a novelist than Paul Bourget came *Sens de la mort*, which, besides its general relevance, is related specially to the war.

In it we meet a famous physician, a skeptic, who knows his early doom is sealed by cancer. Believing in no future life, he cannot bear the thought of leaving behind him his dearly loved wife to live, and perhaps love another, after he has gone, and he ventures to suggest that she die with him when his hour comes. She agrees. Then the war breaks out. The doctor is called to treat a young relative of his wife, a soldier, who has been wounded. The soldier had loved the woman, and his patience in suffering, due to his religious faith, touches her. Her husband releases her from her oath, but dies in despair and misery, while the young soldier, who also dies, passes away serenely and in the odor of sanctity, as a good Christian should. The contrast of the two ends, and the edification of the latter wins back the young woman to Christian faith. Marcel Tinayre offered this year her *Veillées des armes*, which has for a background the first days of the war. François de Niou also concerned himself with the war in *Pendant la guerre*, a love story set successively in neutral countries, then in Germany, then in France. Charles Géniaux's *Les fiancés de 1914* is another novel written hastily to provide war literature. *Prince d'Allemagne* describes the morbid tastes of a degenerate German prince, who is thirsty for human blood, and enjoys a man-hunt as another might the pursuit of game. Several volumes of short war stories may be mentioned: René Bazin, *Récits du temps de la guerre*; L. Frapié, *Contes de la guerre*; H. Bordeaux, *La jeunesse nouvelle, deux héros*; and a collection written by soldiers in the trenches, *Contes véridiques des tranchées, par un groupe de poilus* ("poilu" being, since the war, the word for "soldier" in military slang). Here might also be named such publications as Paul Nohain and Frank Delay's *Histoire anecdotique de la guerre* (appearing serially); Paul d'Ivoy's *Femmes et gosses héroïques*. A. Hermant's *Heures de guerre de la famille Valadier*, and Tristan Bernard's (the famous humorist's) *Le poil civil, gazette d'un immobilisé pendant la guerre* describe the life in France back of the fringeline. In the domain of pure fiction a delicate production by George Auriole deserves mention, *La geste des petits soldats de bois et de plomb*, with pictures of toy soldiers by Helle, evoking the French heroic stories of the past, especially of Charlemagne and of Napoleon.

OTHER WAR LITERATURE. Many notable productions belonging to none of the traditional genres we group here. They are expressions by the ablest pens in France, of the emotions inspired by the war: Lavedan, "Les grandes heures" (his weekly articles in *L'Illustration*); Anatole France, *Sur la voie glorieuse*; Rémy de Gourmont, *Pendant l'orage*; M. Barrès, *Alsace-Lorraine*; *L'âme française et la guerre*; *Une visite sur un champ de bataille*; Paul Loti, *La grande barbarie*; Paul Adam, *Hier, aujourd'hui, demain*; P. Marguerite, *Contre les barbares*; J. Richepin, *Prose de guerre*; V. Giraud, *Le miracle français*; André Suarès, *Nous et eux*; *C'est la guerre*; *Italie! Italie!*; Fanchois, *Veillée des armes*. Of a somewhat special character are the articles of G. Hervé, once the fanatic anti-militarist, and author of *Leur Patrie*. Now *Après la Marne* and *La patrie en danger* show him to be an ardent patriot. Hervé finally enlisted in the army. Romain Rolland justifies in *Au-dessus de la mêlée* his position when, at the begin-

ning of the war (see YEAR BOOK, 1914), he endeavored to assume a moderate attitude. Interesting in different ways are: Nothomb, *L'Yser, Les villes saintes*; R. Benjamin, *Les soldats de la guerre*; Juarès, *Six mois de guerre*; the striking description of the life in the trenches, by Charles Le Goffic, entitled *Diamude*; Abbé Klein, *La guerre vue d'une ambulance*. Notable among memoirs written by influential people who tell about political events of recent years with a view to explaining the present are: Madame J. Adam, *L'heure vengeresse des crimes Bismarckiens*—mostly letters written by the celebrated editor of the *Nouvelle Revue*; Léon Daudet (author of *L'Avant-guerre* in which he eloquently but in vain warned his countrymen against the formidable spy-system of Germany), souvenirs under the title *L'entre-deux guerres* and *Hors du joug allemand*. General Canonge's *Histoire de l'invasion allemande en 1870-71* is a remarkable account of German atrocities in the previous war. Gabriel Langlois's *L'Allemagne barbare*, also dealing with the Germans in 1870, contains a striking chapter showing how the famous anthropologist Quatrefages had refused to believe accounts of German barbarities until he saw Germans stupidly trying to destroy the magnificent collections in the Museum of Paris. Mention should also be made of J. Reinach's *Guerre de 1914-15, commentaires de Polybe*, an anthropological study of the German race; and of Alphonse Séché's *Les guerres d'enfer*, discussing such problems as H. G. Wells deals with in his *Anticipations*—the war of the future, not chiefly on the earth, but under ground, under water, and in the air.

Among books on Belgium properly to be considered here are: Verhaeren, *La Belgique sanglante*; P. Nothomb, *La Belgique martyre*; H. Charriant, *Le droit contre la force, la Belgique terre d'héroïsme*; Maxweiler, *La Belgique neutre et loyale*; R. de Gourmont, *La Belgique littéraire*.

LITERARY CRITICISM. In this department the production is slight. There are to be mentioned, however: a belated book by Benedetto, *Madame de Warens d'après des documents nouveaux*, an attack on Rousseau's friend in Annecy and at the Charmettes; and two little books on *Charles Péguy* (see YEAR BOOK, 1914), one by Suarès, one by Seippel. The unexpurgated publication of the *Journal des Goncourt* was to take place this winter; the editors postponed it on account of the war.

LITERARY EVENTS. The transfer to the Panthéon of the remains of Rouget de l'Isle, the author of the *Marseillaise*, took place on the 14th of July. The most notable deaths which occurred during the year and are not directly connected with the war, are: the historian Mézières, and the playwright P. Hervieu, both of the French Academy; Rémy de Gourmont; Stuart Merrill (the Symbolist poet, American by birth); F. Loliée; Madame Lecomte de Nouy (the author of *Amitié amoureuse*); the entomologist J. H. Fabre. Among the men of letters who gave their lives in the war are: Rob. d'Humières (the translator of Kipling); Lafon (author of *L'élève Gilles*); Paul Acker (author of *Soldat Bernard*); L. Pergaud (author of *Goupil*). The French Academy decided to award all its prizes this year to soldiers who had died in the war. The Grand Prix de Littérature went to E. Nolly; the Grand Prix Gonin, to Ch. Pé-

guy; the Prix du Roman to Paul Acker; the Prix Née, to Psichari; and various other prizes to Ch. Dumas, the poet, to Alain Fournier, Pierre Leroy-Beaulieu, Robert d'Humières, Ch. Picar, André Lafon, and others. The Goncourt Academy awarded its yearly prize to R. Benjamin for his *Soldats de la Guerre*, Gaspard.

FRENCH NAVY. See FRANCE, Navy; and NAVAL PROGRESS.

FRENCH SOMALI COAST. A French protectorate on the Gulf of Aden. Official report gives area 120,000 square kilometers, and population (1911) 213,000. Jibuti, the capital, has about 17,000 inhabitants. Imports (1913), 33,916,843 francs (21,024,712 francs in 1910); exports, 47,704,148 (33,566,887). There are 81 miles of railway in the country. The railway from Jibuti into Abyssinia is being extended to Addis Abeba).

FRENCH THEATRE IN NEW YORK. See DRAMA, AMERICAN AND ENGLISH.

FRENCH WEST AFRICA. A French African possession composed of the following colonies and territories, with estimated area and 1911 population as follows:

	Sq. km.	Pop.
Senegal	191,600	1,247,096
French Guinea	239,000	1,927,000
Ivory Coast	825,200	1,265,000
Dahomey	107,000	902,000
Upper Senegal and Niger	782,700 }	6,085,000
Mil. Ter. of the Niger	1,383,700 }	
Mauritania	893,700	250,000
Total	*3,922,000	11,626,000
* 1,514,682 square miles.		

The products and exports are peanuts, rubber, palm kernels, palm oil, gum arabic, live animals, etc. Imports and exports of the colonies in the 1913 trade as compared with the trade in 1910 are seen below (values in francs):

	Imports		Exports	
	1910	1913	1913	1910
Senegal	82,607,568	88,070,795	72,937,825	64,254,179
Upper Senegal and Niger	7,036,901	10,783,390	3,681,987	8,996,984
French Guinea	29,562,772	19,418,212	16,644,752	18,306,405
Ivory Coast	16,049,454	18,154,499	16,401,815	15,749,700
Dahomey	17,838,753	15,152,404	16,477,478	17,886,254
Total	153,095,448	151,574,800	126,148,852	125,193,472

The total value of all imports for 1912 was 134,781,892 francs; of this total, imports valued at 55,336,990 francs came from France, 2,516,518 francs from French colonies, and 76,928,474 francs from other countries. Total exports, 118,567,231 francs; of which, exports valued at 57,614,182 francs were received by France, 95,281 francs by French colonies, and 60,857,768 francs by other countries. At the ports of Senegal there were entered in the 1912 trade 1081 vessels, of 2,318,349 tons; French Guinea, 730, of 724,828; Ivory Coast, 397, of 925,597; Dahomey, 441, of 585,537. The total debt stood, Jan. 1, 1912, at 156,277,336 francs. French West Africa is administered by a Governor-General. The several colonies are under Lieutenant-Governors. Dakar, in Senegal, is the capital. Governor-General (1915), W. Merlaud-Ponty.

For railways, etc., see the articles on the separate colonies and territories.

FRENNSEN, GUSTAV. See GERMAN LITERATURE, Poetry.

FRIENDS, RELIGIOUS SOCIETY OF. There are

four bodies of Friends: the Orthodox, Liberal (Hicksite), Wilburite, and Primitive. The Orthodox body is the most numerous. It has, according to the latest statistics (1914), 98,356 members, 1315 ministers, and 775 meeting-houses. The Hicksite body has 19,597 members, 99 ministers, and 211 meeting-houses; the Wilburite, about 3880 members, 47 ministers, and 48 meeting-houses; the Primitive, about 171 members, 10 ministers, and 8 churches. The Liberal or Hicksite branch has recently shown much activity and a considerable increase in membership. In 1915 three summer schools were held under Hicksite direction at Swarthmore, Pa., at Waynesville, Ohio, and in Canada.

FROHMAN, CHARLES. American theatrical manager, died May 8, 1915. He was born in 1860, in Sandusky, Ohio, but removed when still a young boy to New York City, where he received his education in the public schools. For several years he was employed in newspaper offices, acting from time to time as an usher in theatres. In 1880 he secured employment with the Chicago Dramatic Company with which he remained for two seasons. He then acted for some time as manager of a minstrel troupe. After several years, he became associated with his brother, Daniel, in the management of the Madison Square Theatre. In addition to this, he was interested in a number of minstrel companies, which he sent over the country, and in several touring dramatic companies. His first considerable success was in connection with his management of Bronson Howard's war play *Shenandoah*. This brought him a considerable fortune. He was now well known among theatrical managers. He installed a stock company which included Maude Adams, in a theatre on 23rd Street, New York City, and there produced *Men and Women*, by Belasco and De Mille, and other well-known

plays. Of these was *Charley's Aunt*, one of the most successful farces ever acted in the United States. Some years later Mr. Frohman acquired the Empire Theatre; and he brought one theatre after another in New York City under his control. Then he attempted management in London, where, eventually, he controlled as many as four different theatres. At the time of his death, however, he had parted with all but one of his London houses. Mr. Frohman was always more favorably disposed to English and French playwrights than to those of his own country. Among his closest friendships was that with James M. Barrie, and of Barrie's plays he presented, notably, *The Little Minister* and *Peter Pan*. Among the actors whom he developed into stars were Ethel Barrymore, John Drew, Maude Adams, Billie Burke, and Julia Sanderson. During the later years of his life, he gradually gave up his theatrical activities in New York, and at the time of his death controlled only two theatres in that city. He was, however, associated with other managers in the control of

theatres there and in other cities. Mr. Frohman was little known outside the circle of his most intimate friends. Practically all his interest was in the theatre and in subjects connected with it. He was traveling to England on the *Lusitania* when that ship was sunk by a German torpedo. A friend who was by his side when the torpedo struck said that his last words were: "Why should we fear death? It is the most beautiful adventure in life." See **DRAMA, AMERICAN AND ENGLISH**.

FRUIT. See **HORTICULTURE**.

FRYE CASE. See **UNITED STATES AND THE WAR**.

FULLER'S EARTH. In 1910, John Uri Lloyd, of Cincinnati, noted that fuller's earth when added to alkaloids diminished or abolished their bitter taste and that most alkaloids could be removed from solutions by means of it. This activity apparently resided in the finest particles of the earth which Lloyd separated by elutriation from the coarser particles. This preparation has since been known as Lloyd's reagent. (Lloyd believed at first that his reagent would be a universal antidote for alkaloids, but Felter, in 1911, showed that strychnine in combination with Lloyd's reagent was still capable of killing a dog. Lloyd then suggested that the addition of tartaric acid to his reagent might increase its antidotal value, and this has been found to be the fact.) It is now proposed to use fuller's earth as an antidote for poisoning by vegetable alkaloids. Bernard Fantus has made a study of the relative value of several of the preparations of fuller's earth now upon the market in regard to their absorptive power for alkaloids. He finds that Lloyd's reagent is the most active in this respect, whereas kaolin, the fuller's earth of the United States Dispensatory, has comparatively little or no value. The alkaloids tested were morphine, quinine, nicotine, cocaine, aconitine, strychnine, and colchicine. The antidotal value of fuller's earth in morphine poisoning is much superior to that in strychnine poisoning. It has also a marked antidotal action in cocaine, nicotine, and ipecac poisoning. Although it has less value in neutralizing strychnine and aconitine, even here it may save life if combined with sodium dihydrogen. In this connection the work of Kraus and Barbara, with regard to the action of charcoal and kaolin in deep wounds, may be mentioned. They found that filterable viruses are taken up by charcoal so rapidly that they lose their toxic properties for the tissues. They suggest that kaolin and charcoal might be utilized to arrest infection in wounds.

FUR. An interesting development of the year in the American fur industry was the operation of the only sealskin plant in the United States, which was engaged in unhairing and dyeing 7000 skins, the property of the United States government, and secured from Alaskan seals during the closed season. This work was being done at the warehouse of Funston Brothers and Company of St. Louis, and 15 experts from London were engaged in this work. London formerly was the centre of the sealskin industry, and such work as is now done in St. Louis was carried on there. When the closed season of five years ends, and the killing of seals can be carried on by private individuals, it was believed that St. Louis would take the place of London as the sealskin market, and the plant would be increased to take care of the larger numbers being treated. In that event

it was expected that sealskins would be much cheaper.

Alaskan conditions as regards fur-bearing animals have become complex. The steady expansion of the industry of fox-farming has led to injurious inroads on wild game, which the United States Department of Commerce has endeavored to remedy by revised regulations, Circular 246, June 1, 1915. Fur shipments from Alaska are now tabulated for the year ending November 15th, so as to correspond with the annual take in the open season. The following figures indicate the more important furs taken in the years 1913 (precede) and 1914 (follows) respectively: Ermine, 6559 and 6873; red fox, 10,820 and 14,967; white fox, 3756 and 6530; lynx, 4772 and 6930; marten, 9682 and 6497; mink, 47,082 and 35,623; muskrat, 163,616 and 101,202; land otter, 1300 and 1008. It is yet a closed period for fur-seal. The value of the Alaskan furs, land and marine, for 1915 approximates \$460,000, including the 3000 seal-skins taken from animals killed for food on the Pribilof Islands. No pelagic skins were reported.

In October the United States initiated public auction sales of its Alaskan furs, which hitherto have been sold abroad. The list was led by the 513 blue-fox skins, which brought an average of \$114.45 per skin, an advance of about \$72 over the price at the last sale. Eight selected lots of blue-fox brought prices ranging from \$245 to \$273 per skin. The best grade of white-fox sold for \$30 and the lowest for \$17, the average being \$24.55 per skin. Unprime beaver brought from \$9 to \$17 per skin. Silver-fox (non-government) brought prices ranging, for seven pairs, from \$1060 to \$2610 per pair. See also **ALASKA**.

GALICIA. See **AUSTRIA-HUNGARY**.

GALLIENI, GENERAL. See **FRANCE, History, passim**.

GALSWORTHY, JOHN. See **LITERATURE, ENGLISH AND AMERICAN, Fiction**.

GALVESTON. See **HURRICANES**.

GAMBIA. A British West African colony on the river Gambia (area, 69 square miles), with a protectorate extending on both banks of the river for 250 miles from its mouth (about 4000 square miles). Capital, Bathurst. Population of St. Mary's Island, on which Bathurst is situated, 8807; of the protected districts, 152,000. The cultivation of peanuts is the principal industry. Imports, 1913, £1,091,129 (1910, £578,983). Imports of cotton goods in 1913, £201,797 (£130,611 in 1910); kola nuts, £91,381 (£85,534); rice, £62,512 (£46,087); sugar, £19,422 (£9708); spirits, £17,141 (£7129); specie, £471,835 (£208,544), etc. About 49 per cent of the imports come from England. Exports, 1913, £867,187 (1910, £535,447). Exports of peanuts (mostly to France) in 1913, £622,098 (in 1910, £387,943); hides, £18,718 (£11,310); palm kernels, £9026 (£5640); specie, £204,781 (£112,194); etc. Revenue, 1913, £124,995 (1910, £82,880); expenditure, £95,211 (£63,301).

GARBAGE AND REFUSE DISPOSAL.

The general status of the disposal of garbage, ashes, and miscellaneous refuse was unchanged in 1915. Of the larger cities of the United States that have changed from primitive means of garbage disposal, most depend upon garbage reduction to recover grease and fertilizer base from the garbage. Other cities, large and small, employing improved means of garbage

disposal, rely upon incineration. The Chicago reduction plant, bought from a company in 1914, and immediately improved by the city, was further improved in 1915, and in addition, steps were taken to build incinerating plants for outlying districts. The municipally-owned plants at Cleveland and Columbus continued in use, and a new one was put in operation by Schenectady, N. Y., at the very beginning of the year, and still others were being built for Akron and for Dayton, Ohio. The privately-built reduction works for Los Angeles, Cal. (see YEAR BOOKS for 1913 and 1914), of the Cobwell type, were put in operation. At the Milwaukee garbage refuse-incinerating plant some progress seemed to have been made with the utilization of the heat of combustion for the production of more electric current than was needed for works purposes, the surplus being transmitted two miles and used to pump water for ameliorating the condition of a sewage-polluted river. A much smaller refuse incinerator at Palo Alto, Cal. (5500 population), having a rated daily capacity of 30 tons, burned a total of 1872 tons in the year ending June 30, 1915. It cost \$2468 to collect the refuse, \$1605 to burn it, \$654 for general expense, and \$1593 for capital charges, making a total of \$6322 yearly gross expense for collection and disposal. Householders were charged \$3051 for collection, there was a credit of \$85 for steam delivered to a power plant, and enough miscellaneous revenue to bring the total receipts up to \$3204. This made the net cost of collecting and disposing of 1872 tons of refuse \$3118. The scale of collection charges was from \$0.15 a month for collections twice a month to \$1.75 a month for daily collections. Beginning July 1, 1915, the charges were raised to the following rates per month: Collections twice a month, \$0.25; once a week, \$0.50; twice a week, \$0.80; three times a week, \$1.25; six times a week, \$2.50.

In Canada, as in Great Britain and Europe generally, garbage is burned rather than reduced—almost always combined with other city refuse. The Health Department of Milwaukee, as the winter of 1915-16 approached, suggested in its *Health Bulletin* that householders would do well to drain their garbage, wrap it in paper after each meal, and burn it in their stoves or furnaces when fires were available. By this means decaying, odor-producing garbage would be obviated and, it might have been added, the burden on the refuse incinerator would be lessened.

GARDENING. See HORTICULTURE.

GARNETT, THEODORE STANFORD. An American lawyer, died April 27, 1915. He was born in Richmond, Va., in 1844, and received a high school education. He enlisted in the Confederate army as private and rose to the rank of captain, serving as aide on the staffs of Gens. J. E. B. Stuart and W. H. F. Lee. After 1873 he practiced law in Norfolk, Va., and became one of the best known lawyers in the State. He was a member of many patriotic societies, and trustee of several important institutions.

GARRETT, MARY E. An American philanthropist, died April 3, 1915. She was born in Baltimore, the daughter of John W. Garrett, president of the Baltimore and Ohio Railway. At her father's death in 1884 Miss Garrett inherited a third of his large fortune. Thereafter she devoted her time and money to education and to philanthropy, giving large sums to the advancement of medical education for women and

to woman suffrage. In association with Miss Carey Thomas, now president of Bryn Mawr, and three other Baltimore women, she established in 1885 a Bryn Mawr School for Girls at Baltimore. In 1890 she made it possible for the medical school of Johns Hopkins to open its doors and secured the admission of women to it on equal terms with men. She organized committees of women in many States to raise a subscription of \$100,000 to help endow the medical school, and herself contributed over \$300,000. Her gifts to Bryn Mawr amounted to over \$150,000. From 1893 she gave annually to the trustees of the college \$10,000 to be expended for academic purposes. In 1908 she rebuilt, decorated, and furnished the president's house at a cost of over \$100,000. She was elected a director of the college in 1906. She took an active part in furthering woman suffrage.

GARY SCHOOL SYSTEM. During the past few years Superintendent Wirt has developed a system of organization and instruction in the public schools of Gary, Ind., that has attracted much attention. During 1914 the Mayor of New York accompanied by representatives of the Boards of Education and Estimate visited Gary and examined the system with a view to introducing it into the New York schools. The Board of Estimate employed Superintendent Wirt to devote one week in each of 10 months in 1915 to supervising the introduction of his system into several city schools. Two schools were reorganized under the Gary plan, Public School Number 45, the Bronx, and Public School Number 80, Brooklyn. The Board of Education has authorized its introduction into 12 other schools in the Bronx. This reorganization has met with some determined opposition on the part of some of the school officials and teachers. Doubtless it will be necessary to modify somewhat the system used in Gary before it will be adapted to New York conditions.

One of the chief features of the organization of the schools in Gary is the economical use of the school plant. In ordinary schools the building is used for only a part of the day. If, for example, there are eight classes in a school, there are eight class rooms. During the periods that the classes are in the gymnasium or laboratory or on the playground, these class rooms are vacant. Superintendent Wirt organizes his schools in what has been called the "two-school" plan. In place of the 8 classes in an 8 room building, he has 16 classes. One group of 8 classes assembles at 8:15 A.M. The second group comes at 9:15. The activities of the school are divided into four departments. Department one consists of language, mathematics, history, and geography, and the work is conducted in class rooms of the ordinary type. Department two includes science, manual training, drawing, and music, and the classes are conducted in the shops, laboratory, and studio. Department three consists of mass instruction and is conducted in the auditorium. Department four consists of physical training, play, and application, and is conducted in the gymnasiums, swimming pools, playgrounds, and playrooms. The 16 classes are divided into 4 groups of 4 classes each. If one-half of the grades 1-4 are called group A, one-half of the grades 5-8 group B, the other half of the grades 1 to 4 group C, and the other half of the grades 5 to 8 group D, the plan of operation can be indicated as follows:

PLAN OF OPERATION OF FOUR DEPARTMENTS

Time	Department 1	Department 2	Department 3	Department 4
8:15—9:15	A	B		C D
9:15—10:15	B	A	C	D
10:15—11:15	C	D	A	B
11:15—12:15	D	C		
12:15—1:30	A	B		
1:30—2:30	B	A	D	C
2:30—3:30	C	D	B	A
3:30—4:30	D	C		A B

The above plan of operation for a 16-class school should be read as follows: From 8:15 to 9:15 group A, consisting of four classes, grades 1 to 4, is working in the regular classrooms. Group B, consisting of four classes, grades 5 to 8, is working in the shops, laboratories, and studios. The remaining eight classes, composing groups C and D, are working in the gymnasiums, playrooms, or on the playgrounds. From 9:15 to 10:15 group B is working in the classrooms, group A is working in the shops, laboratories, and studios, group C, consisting of four classes, grades 1 to 4, is working in the auditorium, and the remaining children, constituting group D, are still on the playgrounds or in the gymnasiums or playrooms.

Another feature of the Gary plan is the combining of elementary and high schools in the same building. One of the main objects for this combination is the improved shop, laboratory, and auditorium advantages that are offered to the elementary school.

The following quotation gives the Gary idea of a school plant: "It is a playground, garden, workshop, social centre, library, and traditional school combined under the same management. It is considered of the greatest importance that right conditions be provided for the pleasure and recreation of the child and adult. In addition, a properly organized playground, workshop, and school secure the same attitude of mind toward the reading, writing, and arithmetic that the child normally has for play. Also the shop and school features greatly increase the value of the plant as a recreation and social centre for adults.

The school day may be eight and a quarter hours but the organization is so flexible that children may get all of their academic work during four hours in the forenoon or four hours in the afternoon, and if the parents can convince the school authorities that the children's time can be wisely used elsewhere the children are excused from the other four hours' attendance.

The peculiar features of instruction in the Gary plan are departmental instructors throughout the entire school and a system of industrial education in which artisans are employed as instructors and the regular repairs and additions to school furniture and buildings furnish the basis of instruction. No attempt is made to fit the younger children to specific vocations. The auditorium is used for definite instruction purposes. The buildings are open Saturdays and evenings, also for a period during the summer. It is claimed that the number of adults who make use of the school building is larger than the number of children enrolled in the schools.

There are conflicting opinions regarding the comparative per capita cost of the Gary system and others. By some it is claimed that the school expenses are greatly reduced by the Gary plan. Others seem to find that there is a considerable increase over the regular cost. No

data which are entirely reliable are at present available.

Superintendent Wirt has been employed for part time during the year 1916 to continue his supervision of the work in New York City.

A number of cities have taken the form of organization and adapted it to local needs.

One of the most reliable descriptions of the organization of the schools in Gary is found in *Bulletin, 1914, No. 18, United States Bureau of Education*, entitled "The Public School System of Gary, Indiana." The best description and evaluation of the instruction given in the Gary schools is to be found in *Schools of To-morrow*, by John Dewey.

GAS ENGINES. See INTERNAL COMBUSTION ENGINES.

GASES, ASPHYXIATING. See CHEMISTRY, INDUSTRIAL, *Asphyxiating Gases*.

GAS-FILLED LAMP. See ELECTRIC LIGHTING; and PHOTOGRAPHY.

GASOLINE. See CHEMISTRY, INDUSTRIAL.

GAS WARFARE. See MILITARY PROGRESS.

GEIKIE, JAMES. A Scotch geologist and educator, died March 2, 1915. He was born in Edinburgh in 1839, and was educated at Edinburgh University. In 1861 he entered the English Geological Survey, becoming in 1869 a district surveyor. He was appointed to the Murchison chair of geology in Edinburgh University in 1882, and held this position until his death. In addition he was dean of the faculty of the university. He received many medals from geological and geographic societies, and was one of the founders and at one time president of the Royal Scottish Geographical Society. He was honorary editor of the *Scottish Geographical Magazine*. His writings include: *The Great Ice Age* (1874), *Prehistoric Europe* (1882), *Outlines of Geology* (1884), *Structural and Field Geology* (1905), *Mountains, Their Origin, Growth, and Decay* (1913), and *The Antiquity of Man in Europe* (1914).

GEMS AND PRECIOUS STONES. The total value of precious and semi-precious stones in the United States in 1914 as reported by the United States Geological Survey, was \$124,651. A demand for the gems at the Panama-Pacific Exposition resulted in an increased production of turquoise of \$13,370, as compared with \$8075 in 1913. No discoveries of unusual deposits of gem minerals were made during the year, but a few prospects for the less valuable gems were found. Among these were the pink beryl in Maine, amazon stone, a variety of feldspar, in California, New York, and Maine, sunstone in Arizona, and turquoise in Nevada.

GENERAL EDUCATION BOARD. See UNIVERSITIES AND COLLEGES, section so entitled.

GENERATORS. See DYNAMO-ELECTRIC MACHINERY.

GENETICS. See ZOOLOGY, *Genetics*.

GEODETIC SURVEY. See EXPLORATION, *Oceanic*.

GEOGRAPHICAL SOCIETY, AMERICAN. A scientific body organized in 1852 with headquarters at New York City. During 1915 about 40,000 persons attended the public exhibitions of the society, at which were displayed war maps of Europe, and exhibits on the development of the Philippines and of Alaska. The Cullum Geographical Medal of the society was awarded to J. Scott Keltie, the Daly Medal to Prof. Paul Vidal de la Blache. The society's *Bulletin* for

1915 (984 pages), which was edited by Cyrus C. Adams, covers the new geographical investigations of the year as well as special articles and geographic notes on the European war. In 1915 was published the *Memorial Volume of the Transcontinental Excursion of 1912*, which was announced as in preparation in 1914. On Jan. 1, 1915, the society had 1127 members. The officers for 1915 were as follows: Honorary president, Archer M. Huntington; vice-presidents, James B. Ford, John Greenough, and Anton A. Raven; foreign corresponding secretary, William Libbey; domestic corresponding secretary, Archibald D. Russell; recording secretary, Hamilton Fish Keen; treasurer, Henry Parish, Jr.

GEOGRAPHIC SOCIETY, NATIONAL. The work of the Society in 1915 covered a wider field than in any previous year. Two scientific expeditions were maintained, one engaged in archaeological and geographic research in the highlands of Peru, and the other in the making of Alaskan studies in connection with the development of that Territory. The Society expended \$20,000 as its share in the maintenance of the National-Geographic-Society-Yale-University-Peruvian Expedition, which was in charge of Prof. Hiram Bingham. The results of the expedition, as thus far analyzed, confirm the opinion that Machu Picchu was the capital of the Incas when their nation was in its golden age. During the work of the expedition in its three years in the field more than 12,000 pictures were taken, of which 1000 were of Peruvian Indian types, 3000 of ruins, more than 1000 of manners and customs, and 4000 illustrating the topography, physiography, and geology of the higher Andes. O. H. Tittmann, who for 48 years was connected with the Coast and Geodetic Survey, was elected to succeed the late Henry Gannett as president of the Society, of which Gilbert H. Grosvenor is the director and editor. The *National Geographic Magazine* is published monthly by the Society. The membership was 424,477, a net gain of 87,031 for the year.

GEOLOGY. There were no outstanding features that seemed to mark a definite trend in research during the year 1915, but great activity was manifest in all departments of geology, as indicated by the array of periodical literature and treatises of the most varied subject matter. Only a few of the contributions can be noted, and attention will be paid especially to those of broad significance or popular interest. A prominent place in the record must be assigned to the publication of a general account of the geology of the world (*Handbuch der regionalen Geologie*), which had been undertaken by Steinmann and Wilckens with the co-operation of many assistants for the different countries and regions to be described. In all, 55 parts were to be issued, each following a common plan of treatment. The scope is comprehensive, and includes consideration of the morphology, stratigraphy, petrology, geological history, mountain systems, and economic features, with a supplementary bibliography. In view of the proposed publication of an international geological map, upon which work had already been begun by the issue of the section covering the Continent of Europe, the present undertaking seems timely, both from scientific and practical standpoints.

RADIOACTIVITY AND THE AGE OF THE EARTH.

The possible relations of radioactive energy to the rate of cooling of the earth, on the assumption of a once molten globe, continue to attract attention as further data in regard to the distribution of radium are made known. The researches of Strutt and Joly in this connection have already been discussed (see *YEAR BOOK* for 1909). Arthur Holmes presents the latest results that bear upon the problem and estimates the effect of radioactivity to be equivalent to three-fourths of the present flow of heat; the period of cooling in consequence is raised from 22 million years to 1600 million years, on the basis of an earth heated uniformly to 1000° C. at the start. If the quantity of radium that has been found to exist in the surface rocks were distributed in the same ratios throughout the entire body, it would more than supply the loss of heat from conduction and radiation, and the earth actually would be getting warmer, but there is little doubt that the radioactive energy decreases with depth, as also it is not equally distributed. The oldest igneous rocks now exposed may date back 1500 years, according to the ratios derived from the radioactive elements.

ISOSTASY. Becker considers the geodetic evidence in support of isostasy to suffice for its demonstration. The level at which compensation takes place is the level of easiest fusion or eutectia in the earth, and below that depth the materials have cooled only to a trifling extent or are nearly in a state of ease. The permanence of the continental masses above sea bottom indicates that the mean density of the subcontinental columns of rock down to the zone of compensation is lower than the density of the suboceanic columns. This difference is ascribable to a moderate excess in the proportion of voids beneath the continents (about 3 per cent) or to an excess in mean temperature (some hundreds of degrees) or to a combination of the two causes. It is thought that the outer layer takes in heat energy of very high temperature and discharges it by conduction and radiation at a little above zero, while a part of the energy thus made available is converted into mechanical work implied in uplift, rupture, and plication of the continents. The compensation level, according to the calculations of geodesists, is between 110 and 140 kilometers from the surface. The smaller depth is unacceptable as a basis for the calculation of the earth's age, leading to results that are insufficient for geological requirements. A depth of 140 kilometers indicates an age of 100,000,000 years and the probable value seems to lie between this as a maximum and 68,000,000 years as a minimum. On the basis of 100,000,000 years the contribution of radioactivity would be 26 per cent of the total heat lost. Becker is inclined therefore to take a more moderate view of the importance of this energy than the English physicists whose opinions have already been expressed.

VOLCANISM. The Silliman lectures at Yale University by Iddings dealt with the problems of volcanism and the origin of igneous rocks; they developed no new theories but afforded a critical estimate of those already formulated. The view is taken that the source of thermal action may be found in radioactivity, without calling upon the residual heat of a cooling globe. As to the condition of the earth's interior Iddings holds there is no reason to believe that it may not be solid and cold.

PHYSIOGRAPHY. A series of papers by J. D. Falconer treated of the origin and relations of the earth's physical features, with a philosophic discussion of recent work in this field. As a starting point for his treatment of landforms, he assumed that "the face of the earth was originally fitted out with a certain primary relief, and that this relief has been from time to time locally restored and rejuvenated in order to counteract the activity of the superficial forces of denudation which tend to lessen and remove all irregularities in relief. In this way we advance to the idea of Primary features or forms of the earth's surface, whose origin may be ascribed directly to the activity of the subterranean forces, as opposed to Secondary features or forms which have originated on the surface as the result of the activity of the superficial forces." In the place of Primary and Secondary, which already have definite historical significance in geology, he used the words endogenetic and exogenetic for the two main groups. Endogenetic forms are divided into tectonic forms, arising from radial or tangential activity of the subterranean forces, and volcanic forms, ascribable to local igneous activity as a proximate cause. The exogenetic forms are divided into degradation forms and aggradation forms.

CORAL REEFS. As the result of his studies of the coral formations of Florida and the West Indies, Vaughan concludes that the coral organisms have played a subordinate part in the building of the Floridian plateau. The development of coral reefs took place on a subsiding platform which owed its origin to causes other than those dependent on the growth of corals. The work of corals in the constructional way is not so important as has been believed. All known offshore reefs, which have been investigated, grow on submerged platforms of recent depression. Furthermore, there is no evidence to show that long-continued subsidence has taken place in any coral-reef area, or that a barrier reef began to form as a fringing reef and assumed its present aspect through sinking of the land. This view does not accord with Darwin's theory, but has reference to a single region and perhaps may not be broadly applicable. Another important observation made by Vaughan is that corals and coralline algae are less important agents in the abstraction of calcium carbonate from sea water than many other kinds of organisms; bacteria rank first in this respect, followed by foraminifera and mollusks.

ORIGIN OF DOLOMITE. As a test of the theory that crinoids secrete magnesia and thus possibly participate in the formation of dolomite, Clarke and Wheeler analyzed a number of different species from various geological horizons. In some recent species they found from 7 to 13 per cent, those of warmer waters being relatively richer in the substance, for some unexplainable reason. The fossil forms, from Ordovician to Eocene age, showed in one example about 20 per cent, but the rest only from 1 to 2.5 per cent. The large result in the one case may have been due to a later dolomitization of the rock from which the sample came. The evidence, therefore, does not appear to give much support to the theory.

SEDIMENTATION. In connection with the wear of the lands by erosion and the upbuilding of the continental platforms by deposit of the waste, calculations of the amount of sediment

carried by the great rivers are of pertinent interest. Keilhack contributes some data obtained from measurements of the Yangtze, near its mouth at Wusung. The flow of the river is estimated at 3,500,000 cubic feet per second in flood and 1,750,000 cubic feet per second as a mean for the year. Filtration experiments indicated that 37,500 pounds of detritus were carried per second, or 584,000,000 tons per year. The total discharge of sediment is reckoned at 8840 million cubic feet, enough to cover 300 square miles to a depth of 1 foot.

PRE-CAMBRIAN FORMATIONS. Miller and Knight, working in the crystalline rocks of Ontario, a region made notable by Sir William Logan's early studies, submit a new classification of the formations which embodies many innovations, in fact amounts to a complete recasting of the earlier systems. Its most important feature, perhaps, is the abandonment of the dual idea—the division into two main groups, Archean and Algonkian, adhered to in America—which they regard, with some reason, to be no longer tenable. Accordingly, they range the several parts in a single series. At the base of the system, the oldest in point of time, is the Loganian division, composed of the Keewatin (igneous) and Grenville (sedimentary). Next in order comes the Laurentian intrusives, mostly granitic gneisses. After an interval marked by a great unconformity follows the Timiakian division. Another period of igneous intrusives (Algoman) is followed by a time break or unconformity and then the Animikean which includes the rocks hitherto classed as Huronian. Following an unconformity comes the Keweenawan, the youngest of the Pre-Cambrian series. The present, it may be said, is a transition period in the study of Pre-Cambrian geology, and although the earlier ideas have been largely superseded by the growth of knowledge, opinions are still far apart as to the methods to be used in the arrangement of these very complex formations. The proposed scheme formulates the results of observations in one of the more important areas.

GLACIAL PERIOD. Some recent contributions by European geologists reopen the question as to the existence of more than one general glacial invasion during Pleistocene time, which in the view of many writers—perhaps the greater number of those in Europe and America—should be divided into several stages of ice-advance, separated by interglacial epochs. Six glacial stages have been enumerated by James Geikie, of which two, however, are really post-glacial climatic changes of minor importance. His conclusions were based largely on observations in the Baltic country. In opposition to his interpretation of the evidences, Holst expresses the view that the North German drift has but a single terminal moraine; whereas the so-called interglacial deposits occur locally and sporadically, indicating melting stages but not intervals between successive general advances of the ice. A somewhat similar attitude is taken by Genitz, who maintains the essential unity of the invasion by the ice over northern Europe, though there are evidences of a prolonged interval of melting, not, however, to the extent of bringing about a complete withdrawal. He describes the course of events leading up to the glacial period as introduced by a relative uplift of the land and retreat of the Tertiary sea, with a climate, at

first, much like the present climate in that part of Europe. Further uplift of the land brought on heavy precipitation in the form of snow and the formation of glaciers and ice-sheets which pressed on from the north in Scandinavia and drove the Arctic fauna and flora before it, resulting in the partial migrations of the life forms that were native to middle Europe and commingling of the others with the Arctic types. The pressure of the ice load upon Scandinavia, and perhaps upon the Alps, lowered the gathering ground for the glaciers and brought on milder conditions when the ice-front retreated as far as the Baltic terminal moraines. Then came a renewal of uplift and an increase of the supply for a time. A period of long-continued subsidence brought an end to the invasion, with flooding of the uncovered stream valleys by waters which issued from the glaciers, and the deposit of sediment in terraced beds.

JURASSIC-CRETACEOUS BOUNDARY. The delimitation of the Jurassic and Cretaceous systems as developed in America is one of the larger problems in stratigraphic geology still to be settled. Thus, in the Rocky Mountain region of Montana, Wyoming, Utah, Colorado, and other States there exists a series of beds, variously named in their local distribution but bearing the general designation of the Morrison formation. The beds have been attributed by some writers to the Upper Jurassic, by others to the Lower Cretaceous, and by still others as containing members in each of the systems. The question of their age has recently been considered by a symposium of geologists who discuss it from the several viewpoints of physiography, stratigraphy, paleontology, and paleobotany. An introductory summary by H. F. Osborn presents the problem with the lines of possible evidence, and records the belief that the formation can not be assigned as a whole to either the Jurassic or Cretaceous systems, but occupies an intermediate position. He thinks the problem can only be settled by a comparison of American with European time values, and is of the opinion that the best evidence for correlation between remote areas, like those of different continents, is to be found in paleontology. For the changes of life forms offer the most stable and orderly phenomena serviceable for correlation purposes. Large earth movements which have been sought as a basis, on the other hand, are of uncertain value in the want of proof of their coincidence in point of time. The adherents of the latter methods can only prove their case by showing the existence of great diastrophic movements at the close of Jurassic time in the Rocky Mountain region, in England, and in other parts of the world.

CLOSE OF CRETACEOUS TIME. The prevalent views in regard to the demarcation of the upper limits of Cretaceous time, bringing to a close the Mesozoic era preparatory to the start of the next great era, the Cenozoic, are given in a symposium of American geologists, with an introduction by Osborn. The question revolves largely about the interpretation of evidence and the relative value to be given to earth movements and fossils for stratigraphic correlation, a subject that has already been referred to in a preceding paragraph. The consensus of opinion, from which some dissent is expressed, seems to be that the termination of the Cretaceous should be considered as coincident with the passing of

the age of reptiles, indicated by the extinction of the great families of terrestrial dinosaurs. This view accords with the classification adopted by European geologists. As applied to the Cretaceous formations of the West, the plan is to draw the limits at the top of the Lance beds and to place the Puerco and Torrejon beds containing the remains of the oldest mammals in the Tertiary.

ECONOMIC GEOLOGY. Among recent works of reference on the economic aspects of geology is an English edition of the comprehensive treatise by Beyschlag, Krusch, and Vogt. The translation has been made by Truscott and bears the title, *The Deposits of the Useful Minerals and Rocks, Their Origin, Form, and Content*. A volume by Hager, *Practical Oil Geology*, brings together the results of investigation in regard to the distribution of oil-pools and the structural features that accompany them, with particular attention to recent developments in the American fields. It also contains instructions upon prospecting and mapping of oil territory, the placing of drill-holes, and technical matters.

The methods by which coal beds have been formed have been under investigation for a long time, although it has been well established that they are the result of the decomposition of plant remains. Present opinion is divided, however, in regard to one important circumstance—whether the beds in their actual position are on the sites of the coal-forming forests, as suggested by the occasional discovery of roots and trunks of trees seemingly in place and by the similarity of the underlying clays to depleted soils; or whether the plant materials may have been transported from the place of growth by water and assembled finally on the bottoms of lakes and lagoons, there to be transformed into coal. In support of the latter view it has been shown that coals rich in bituminous matter consist largely of spores and pollen that could hardly accumulate elsewhere than in standing water. E. C. Jeffery has taken up the problem with the use of the microscope, adopting special methods for making the necessary thin sections which ordinarily are difficult to prepare. The examination of many examples of coals of different kinds and from different localities shows the almost universal presence of spores; this the writer regards as strong evidence in favor of the transport or allochthonous theory of origin. Present-day peat bogs, he considers, throw no light on the process of accumulation of plant material in past ages, since they are not found in warmer climates, which are thought to correspond to the probable climate of the Carboniferous age when the coal-forming process was at its height. The different kinds of coal depend upon the relative abundance of the spores. Cannel coal and oil shale are characterized by the largest proportion; coking and gas coals by a plentiful amount; whereas bituminous coals have a relatively small proportion. Anthracite is regarded as a modified bituminous coal, devolatilized by pressure and heat.

The character of petroleum, according to David White, is governed by the state of carbonization of the shales and coal with which the oil may be associated. Petroleum pools are not to be looked for in regions where the coals that lie in or above the oil formation have reached the stage of carbonization at which the fixed carbon exceeds 75 per cent of the whole, as in anthracite

districts. Formations with a relatively high percentage of fixed carbon yield the oils that are highest in saturated hydrocarbons and lowest in gravity, or the oils of most commercial value, such as are found, for example, in the Appalachian region. Formations showing lesser alteration of the organic debris produce oils of lower grade, that is, with more of the unsaturated and heavier hydrocarbons; the lignitic beds are characterized by oils of the lowest grade of all. It would appear, therefore, that as organic matter is altered into material with progressively higher carbon, through the elimination of oxygen, hydrogen, nitrogen, and some carbon, the distillates in the rocks progressively become richer in hydrogen. Instances of the discovery of light oils in association with low-grade districts, from the standpoint of fixed carbon ratio, may be ascribed to the migration of the distillates from sources in more highly altered rocks. The fact that oils are not found in regions of greatly altered rocks but seem to be restricted to those in which the strata have not advanced beyond a very moderate stage of alteration, is scarcely in agreement with the inorganic view of the origin of petroleum.

See also *EXPLORATION, Africa*.

GEOPHYSICAL LABORATORY. See *CARNegie INSTITUTION OF WASHINGTON*.

GEORGETOWN UNIVERSITY. A Roman Catholic institution for higher education founded at Washington, D. C., in 1789. The total enrollment in all the departments in the autumn of 1915 was 1365. The faculty numbered 201. Hon. Henry S. Boutell was appointed professor of statute law, and Rev. George F. Quirk, S.J., professor of metaphysics. No noteworthy benefactions were received during the year. The library contained about 120,000 volumes.

GEORGE WASHINGTON UNIVERSITY. An institution for higher learning, founded in 1827 at Washington, D. C., as Columbian University. The total enrollment in all departments was 1799. The faculty numbered 225. There were no notable changes in the membership of the faculty during the year. There was received for the establishment of the Knapp Scholarship Fund \$2000. The productive funds of the university amounted at the end of the fiscal year 1915 to \$136,340, and the income to \$5489. The library contained about 50,000 volumes.

GEORGIA. POPULATION. The population of the State, on July 1, 1915, as estimated by the United States Bureau of the Census, was 2,816,289. The population in 1910 was 2,609,121.

AGRICULTURE. The acreage, production, and value of the principal crops, as estimated by the United States Department of Agriculture, in 1914-15 were as follows:

		Acreage	Prod. Bu.	Value
Corn	1915	4,330,000	64,950,000	\$50,661,000
	1914	4,000,000	56,000,000	47,600,000
Wheat	1915	325,000	3,575,000	4,612,000
	1914	140,000	1,694,000	2,270,000
Oats	1915	905,000	17,648,000	11,648,000
	1914	450,000	9,000,000	6,300,000
Rye	1915	13,000	120,000	168,000
	1914	13,000	121,000	182,000
Rice	1915	900,000	26,000	23,000
	1914	1,100,000	31,000	28,000
Potatoes	1915	16,000	1,040,000	1,080,000
	1914	13,000	780,000	819,000
Hay	1915	300,000	a 345,000	5,210,000
	1914	250,000	388,000	5,476,000
Tobacco	1915	1,700	b 1,496,000	844,000
	1914	1,900	1,900,000	475,000

		Acreage	Prod. Bu.	Value
Cotton	1915	4,700,000	c 1,900,000	103,513,000
	1914	5,433,000	2,718,000	89,674,000
		a Tons. b Pounds. c Bales.		

MINERAL PRODUCTION. The total production of coal in the State in 1914 was, with the exception of 1911, the smallest since 1886. It amounted to 166,498 short tons valued at \$239,462. The production in 1913 was 255,626 tons, valued at \$361,319.

FINANCE. The latest report available for the financial condition of the State is for the year ending Jan. 1, 1914. The receipts for the fiscal year were \$6,907,137, and the expenditures \$7,281,030, leaving a balance in the treasury of \$739,625, which includes a balance at the beginning of the year of \$1,113,517. The interest bearing debt amounted on Jan. 1, 1914, to \$6,630,702. Of this amount, bonds, consisting of the bonded debt of the State, amounting to \$3,679,000, matured in 1913.

EDUCATION. The total population of school age in 1913 was 795,484. The total enrollment in the public schools was 615,044, with an average daily attendance of 401,713. The total number of school houses was 7758, and the total value of the same was \$513,543. There were 13,927 teachers. The average monthly salary of white male teachers was \$140, of female teachers \$60; of colored male teachers \$57, of colored female \$30. These figures refer to the special systems. In the county systems the average monthly salary for white male teachers was \$70.52, of white female teachers \$47.80; of colored male \$28.60, and of female \$23. The total expenditures for school purposes in 1914-15 were \$5,505,295, and the total expenditures for higher education \$1,900,648, making a total expenditure of \$7,405,943.

TRANSPORTATION. The total railway mileage in the State of single track on Jan. 31, 1914, was 7325. There were in addition 110 miles of double track. Railways having the longest mileage are the Central Georgia, 1330; the Southern Railway, 909; the Seaboard Air Line, 744; and the Atlantic Coast Line, 484.

POLITICS AND GOVERNMENT. The Legislature in 1915 passed two stringent measures relating to the selling of liquor in the State. The first of these, an anti-shiping bill, provided that a person might receive from outside of the State only two quarts of liquor, one gallon of wine, and forty-eight pints of beer each month. The second measure forbade advertising liquor in any manner. Both these measures were to become effective on May 1, 1916. The Southern Express Company, on November 21st, announced that it would refuse to accept liquor for shipment to the State after May 1, 1916, on account of the stringent provisions of these measures.

POLITICS AND GOVERNMENT. All political events in the State for 1915 were overshadowed by the case of Leo M. Frank, who was in 1914 tried and convicted of the murder of a young girl, Mary Phagan. The circumstances surrounding the trial of Frank were such that the case took on a national interest. It was charged by the defenders of Frank that his trial had been carried on in an atmosphere of hostility both in the courtroom and outside that made it impossible for the jury to render a fair and impartial verdict. The feeling against the prisoner was so intense that he was permitted, by request

of counsel, to be absent when the verdict was announced. An appeal was taken by his counsel to the United States Supreme Court, and on January 19th he was placed under the protection of that tribunal. An order issued by the Court forbade the execution of the death sentence, and made the sheriff of Fulton County, Georgia, responsible for Frank's safety. The attorney for Frank filed in the Supreme Court, February 20th, briefs in Frank's appeal from the Court's refusal to release him in habeas corpus proceedings. The United States Supreme Court on April 19th, by a decision of 7 to 2, denied a writ of habeas corpus. In denying this appeal the majority of the Court held that Frank's absence from the courtroom when the verdict was rendered did not deprive him of due process of law, and that it was a right he could waive and did waive inferentially. The Court also held that the allegations of hostile disorder in and about the courtroom had been rejected by competent State tribunals as untrue. Justices Holmes and Hughes dissented from this opinion. They contended that there had been interference with the deliberations of the jury through the actions of the mob in and about the courtroom, which should entitle him to a review. Frank through his attorneys on April 22nd filed a petition with the State Prison Commission for the commutation of sentence to imprisonment for life. On May 10th he was sentenced to be hanged on June 22nd. Petitions were circulated both in Georgia and in other parts of the United States asking commutation of the death sentence. Over 75,000 letters were received by Governor Slaton, and petitions carrying over 100,000 signatures were sent to him. The hearing for the commutation on petition for another sentence began on May 31st, before the State Prison Commission, and on June 9th the Commission declined to recommend a commutation of the death sentence. This decision was not binding on the Governor, and on June 21st, he commuted Frank's sentence to life imprisonment. The decision was announced barely 24 hours before the time set for the execution, and after he had been taken secretly from the Fulton County jail to the State Prison Farm at Milledgeville. Governor Slaton issued a long and detailed statement giving his reasons for commuting sentence. He said: "Feeling as I do about this case, I would be a murderer if I allowed this man to hang. It means that I must live in obscurity the rest of my days, but I would rather be plowing in a field than to feel that I had that blood on my hands."

For several days the Governor's home was threatened by mobs, and a guard of troops was maintained. Governor Slaton retired from office on June 26th, and was succeeded by Nat E. Harris. On July 17th Frank was attacked while asleep by a fellow convict, William Green. He was severely wounded in the neck, but recovered. On August 16th he was kidnaped by a band of men who overpowered the prison authorities at the State Prison Farm at Milledgeville, Ga., and was taken by automobile to Marietta, where he was hanged in a grove, within a stone's throw of the birth-place of Mary Phagan. The mob numbered about 25 or more men. This act was denounced by the newspapers and officials of the State and by Governor Harris, and a grand jury carried on investigations. No evidence, however, was discovered, which gave

a clew to the instigators of the deed, and in September the grand jury was discharged.

STATE OFFICERS. Governor, Nat. E. Harris; Secretary of State, Philip Cook; Treasurer, Wm. J. Speer; Comptroller and Commissioner of Insurance, W. A. Wright; Attorney-General, Clifford Walker; Adjutant-General, J. Van Holt Nash; Superintendent of Education, M. L. Brittain; Commissioner of Agriculture, J. D. Price—all Democrats.

SUPREME COURT. Chief Justice, Wm. H. Fish; Presiding Justice, Beverly D. Evans; Associate Justices, J. H. Lumpkin, M. W. Beck, Samuel C. Atkinson, and H. W. Hill; Clerk, Z. D. Harrison.

STATE LEGISLATURE:

	<i>Senate</i>	<i>House</i>	<i>Joint Ballot</i>
Democrats	43	180	223
Republicans	1	6	7
Democratic majority ..	42	174	216

GEORGIA, UNIVERSITY OF. A State institution for higher education founded at Athens, Georgia, in 1785. The total enrollment in all departments in the autumn of 1915 was 632. There were 68 members of the faculty. There were no notable changes in the faculty during the year, and no noteworthy benefactions were received. The university is supported almost entirely by State appropriations. The productive fund amounts to about \$400,000. The library contains about 50,000 volumes. The president was D. C. Barrow, LL.D.

GERMAN ACTIVITIES IN THE UNITED STATES. See UNITED STATES AND THE WAR.

GERMAN EAST AFRICA. A protectorate of Germany between the East Africa Protectorate and Portuguese East Africa, bordering the Indian Ocean from the mouth of the Umba to latitude 10° 40' S. It borders Victoria Nyanza at the north, Lake Nyassa at the south, and Lake Tanganyika at the west. The protectorate was established by the Germans in 1885. The rights of the Sultan of Zanzibar over a strip of coast territory were acquired in 1890 by payment of 4,000,000 marks. The capital is Dar-es-Salaam. The estimated area is 995,000 square kilometers (384,170 square miles). The great extent of the country included within the protectorate may be better appreciated by pointing out that it is about equal to the combined areas of New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Ohio, Indiana, Illinois, Michigan, and Wisconsin. The native population is estimated at 7,646,000; other colored, 15,000; whites (Jan. 1, 1913), 5336; total, about 7,666,000. Of the whites, 4107 were German. The number of schools is reported at 1944, with 114,964 pupils. There are ten Protestant and three Roman Catholic missions. In the year 1912-13, 353 whites and 18,868 colored persons were convicted in the courts. The military in 1914 numbered 260 Germans and 2472 colored; the police, 67 Germans and 2140 colored.

The natives cultivate the soil to some extent, raising corn, pulse, and bananas for their own use; they also practice grazing. In 1912, there were 43,617 cattle and 41,647 sheep and goats belonging to whites, and 3,950,250 cattle and 6,398,300 sheep and goats belonging to natives. German plantations, mostly near the coast, produce coconuts, vanilla, tobacco, rubber, coffee,

sugar, tea, cacao, cotton, sisal, cardamoms, etc. Imports and exports in 1907 were valued at 23,806,000 and 12,500,000 marks respectively; in 1910, 38,659,000 and 20,805,000; in 1912, 50,309,000 and 31,418; in 1913, 53,358,000 and 35,550,000. Imports from and exports to Germany in 1912 were valued at 25,819,000 and 17,827,000 marks respectively. The principal exports in 1912 and 1913 were valued as follows: sisal, 7,359,000 and 10,710,000 marks; rubber, 8,426,000 and 8,567,000; hides and skins, 4,087,000 and 5,591,000; raw cotton, 2,110,000 and 2,414,000; copra, 1,563,000 and 2,348,000; earthnuts, 1,273,000 and 1,918,000; insect wax, 829,000 and 1,415,000. Vessels entered at the ports in 1912, 1034, of 1,913,743 tons. The Urambara Railway, in the north, from Tanga to Muhesa, has a length of 219 miles. The Central Railway, from Dar-es-Salaam, reached Kigoma, on Lake Tanganyika, Feb. 1, 1914, the length being 673 miles. Total length of railway in operation in the spring of 1914, 792 miles; under construction, 104 miles. In 1913-14, the local revenue amounted to 16,506,000 marks; expenditure, 23,771,000; in addition, expenditure from loan, 37,500,000. The budget for 1914-15 balanced at 61,271,068 marks, the estimated revenue consisting of 20,471,068 marks local receipts, 3,300,000 marks imperial contribution, and 37,500,000 marks loan.

HISTORY. In the early part of January the British made a descent upon the coast of German East Africa, but were repulsed with considerable losses by the German defenders. On January 8th a British expedition from Mombasa occupied the German island of Mafia off the coast of German East Africa. The following day the German port of Shirati on the east shore of Victoria Nyanza was captured by an Anglo-French expedition. The Germans concentrated in front of Jassin on January 12th and compelled its surrender, though the British tried to bring reinforcements to the town. On February 28th the British declared a blockade on the German East African coast. In March a German raiding party of 300 were repulsed in the Victoria Nyanza region by a party of the King's African Rifles. Few casualties were suffered on either side. Late in April the Germans made several efforts to destroy the connections of the British and French, and were successful in one instance in blowing up a bridge belonging to the Uganda Railway. The damage, however, was only temporary. Between May 9th and 22nd two British expeditions managed to clear the country of the enemy for nearly 30 miles around Simbaenti and to recapture a British steamer on Lake Victoria Nyanza. In the last of June the British under Brigadier-General Stewart were successful in capturing Pukoba, an important port on the west side of the same lake, with losses of only 10 killed and 25 wounded. On September 10th a troop of South African Rifles and a company of the King's African Rifles defeated a German detachment south of the Songue River on the German border. See also **WAR OF THE NATIONS, Africa.**

GERMAN EVANGELICAL SYNOD OF NORTH AMERICA. There were in this denomination in 1915, 290,803 communicants, 1365 churches, and 1058 ministers. Although communicants of this denomination are to be found in nearly all parts of the United States, they are most numerous in the Central and North Central States. The church property is valued

at about \$1,500,000, and over \$1,000,000 is annually expended on the maintenance of churches. The denomination supports missionaries in India, where there are over 4000 adherents. Papers are published in St. Louis. There is a college at Elmhurst, Ill., with a theological seminary at St. Louis. Among other beneficent agencies are charitable institutions for orphans, superannuated ministers, and the widows and orphans of deceased ministers.

GERMANIC LANGUAGES. See **PHILOLOGY, MODERN.**

GERMAN LITERATURE. Comparison of German literature in 1915 with that of the preceding year shows that the war has affected its quality far more than its quantity. For after the first paralyzing effect had worn off, the publication of books and periodicals was resumed with the customary enterprise and energy, and the amount produced was hardly below that of normal times of peace. With a tidal wave of high-strung emotionalism sweeping across the country and carrying its infection into every hut, it was natural that lyric production should be stimulated to an unusual degree. But it was hardly to be expected that poets who, at other times, allowed three or four years to elapse between their individual books of verse, would now produce two or more volumes in a single year. The nationalistic *Leitmotive*, too, was natural under the circumstances, and that it dominated even drama and fiction was not surprising to any reader familiar with the German temperament and with the magic process of mass psychology. That this willing obedience to a powerful suggestion indicates a reaction against that individualism which not so long ago scorned the herd instinct and the herd impulse, is significant; it can be traced in most of the literary products of the year. Another curious phenomenon, and one calculated to contradict the vaunted *Sachlichkeit* of the German mind, is its inability at this time to dissociate the emotional mood of the moment from that intellectual aloofness which alone makes for impartiality. It is interesting to note that the purely critical literary activity has perceptibly diminished, while the number of works, more timely than literary, is quite out of proportion to the whole output of the book mart. It is far more difficult to separate the wheat from the chaff since the main source of inspiration is the war and most writers seem bent upon voicing only the popular sentiment and reflecting little beyond the average attitude of the masses.

FICTION. Two novels stand out of the multitude of works of fiction and challenge serious attention. The first is *Das Gänsemännchen* by Jacob Wassermann, which derives its name from the figure familiar to visitors of Nuremberg, and tells the story of an erratic musical genius, suggesting remotely the influence of Romain Rolland's *Jean Christophe*, though far from reaching the Frenchman's spiritual height. The second is *Lebenssucher* by Lily Braun, whose more or less autobiographical *Memoiren einer Sozialistin* has become a work of documentary importance for our time. In her new book the author makes a young aristocrat the representative of the young generation seeking a new meaning and new values of life, touching here and there upon the race problem, the woman question, social reforms, and other engrossing topics of our time, until the war engulfs the hero and makes an

end of his quest. A posthumous story by Gerhard Ouckama Knoop, *Das A und O*, is a pathetic reminder that no contemporary has appeared to take his place. A new book by the Swiss novelist Jacob Schaffner has always some feature of interest and his latest, *Der Bote Gottes*, reflects his strong personality. Wilhelm Fischer-Graz has published a story of the Styrian vinelands, *Die Fahrt der Liebesgöttin*. Hans Land's novel, *Staatsanwalt Jordan* is a picture of contemporary society. Alfred Schirokauer's *Die siebente Grossmacht* belongs to the same class, but is of cruder calibre. Walter Bloem successfully strikes a popular note in *Das verlorene Vaterland*. Laurids Bruun's *Die freudlose Wittve* and Emil Ertl's *Das Lächeln Ginevra's* are of more finished literary quality and of more limited appeal. The spirited grace of Felix Salten's work makes *Die klingende Schelle* fascinating reading. Arthur Schnitzler's *Der blinde Geronimo und sein Bruder* lacks none of the qualities that have endeared him to a large circle of readers. Anton Ohorn has given us *Hans Holger's Liebesirrungen*, Ewald Gerhard Seeliger *Der gelbe Seedie*, Richard Skowronnek *Das grosse Feuer*, Hanns von Zobeltitz: *Der Alte auf Topper*, and Johannes von Dewall *Auf verlorenem posten*. Kurt Aram has substituted *Die Kusine aus Amerika* for the traditional and much abused American uncle. Another story by the same author is entitled *Der Schatten*. Kurt Martens is a name that always merits attention; his new story is *Hier und drüben*. Wilhelm Hegeler, too, has sent out a new novel, *Die goldene Kette*. The indefatigable Richard Voas has written a novel with the catchy title *Der heilige Haas*. Max May is a newcomer whose Alsatian story *Die Rouillions* has attracted much attention. Bruno Frank, who had so far been known only as a writer of lyric verse, has touched upon Russian revolutionary intrigues in his story *Die Fürstin*, though its chief interest lies in the hero. A number of novels seem more or less directly inspired by the war, among them Ulrich Rauscher's curious story *Vierzig Jahre aus dem Leben eines deutsch-französischen Offiziers* which, though set in the Napoleonic era, suggests many present day inferences. Others are Karl Bleibtreu's *Bismarck*, which he ponderously calls *Weltroman*, Max Geissler's *Nach Russland wollen wir reiten*, Alexander Castell's *Der Tod in den Lüften*, Max Dreyer's *Der deutsche Morgen*, Ernst von Wolzogen's *Landsturm im Feuer*, Rudolf Hans Bartsch's *Der Fliieger*, Nanny Lambrecht's *Die eiserne Freude*, and Arthur Zapp's *Der Spion* and *Verschollen*. Margarete Böhme has contributed a volume of war fiction under the title *Kriegsbriefe der Familie Wimmel*. Ida Boy-Ed has sent out no less than three novels: *Stille Helden*, *Vor der Ehe*, and *Aus einer Wiege*. Clara Viebig's *Eine Handvoll Erde* is of strongly emotional appeal. Maria Janitzschek's *Die Sterne des Herrn Ezelin* has no little charm. Hans von Kahlenberg's *Misere* is cleverly told. Humor is so rare a quality in modern German fiction that the Alsatian René Schickele deserves special mention for his *Trimpopp* und *Manasse*. Freiherr von Schlicht, too, long identified with humorous and satirical stories of military life, continues in his popular vein, both in *Der Flitzmajor* and *Fürstlich Blut*.

The short story is represented by a great number of books, the majority of which contain war

sketches, which do not often rise above the journalistic level. Carl Hauptmann's *Rübezahlbuch* is a noteworthy exception, being a collection of fanciful stories in legendary style, the centre of which is the famous spirit of the Riesengebirge. The only foreign note that enters into that book is the attempt at bringing it up to date by patriotic allusions. The new book by the author of the inimitable *Florentinische Novellen*, Isolde Kurz, is entitled *Cora und andere Erzählungen*. Fritz Blei's *Avalun: Geschichten aus allerlei Paradiesen* and Max Dauthendey's *Geschichten aus den vier Winden* are distinctive in style. Ewald Gerhard Seeliger calls his collection of short stories *Das deutsche Dekameron*. Albert Geiger's *Michael Purtscheiner und andere Erzählungen*, Hermann Hesse's *Knulp*, a book containing three stories, Adolf Schafheitlin's *Das hohe Schweigen*, Alfons Paquet's *Der Sendling*, Rudolf Presber's *Der Don Juan der Bella Riva*, and *Die dritte Kugel* by Leo Perutz are all marked by some striking individual features. The name of Hermann Löns is always greeted by his readers, for his stories of animal and hunting life stand apart from other German fiction. His new book is entitled: *Goldhals. Tier- und Jagdgeschichten*. Kurt Münzer, who some years ago made his debut with a curious mystery play, figures on the title-page of two volumes: *Der jüngste Tag* and *Der graue Tod*. That Marie Madeleine's latest volume should bear the title *Rivieranovellen: Regenbogen der Liebe* is in keeping with the erotic character of her lyric verse. A posthumous volume by Joh. Victor Widmann is entitled *Ein Doppelleben*. Of the books directly inspired by the war must be mentioned Carl Busse's *Feuerschein Novellen und Skizzen aus dem Weltkrieg* and *Klar Schiff*, stories of naval warfare of 1914-15, Lisbeth Dill's *Der Tag in Nancy*, Felix Salten's *Abschied im Sturm*, Emil Lucka's war anecdotes entitled *Das brennende Jahr*, Alexander Castell's *Der Kriegspilot*, Dora Duncker's *Berlin im Kriege* and the very popular, though rather coarse-grained, books by Karl Ettlinger.

POETRY. The most ambitious poetical work of the year is Gustav Frenssen's epic *Bismarck*. Richard Schaukal has published *Kriegslieder aus Oesterreich 1914* and a book of sonnets entitled *Standbilder und Denkmünzen 1914*. Gustav Schüller, too, has two books of verse to his credit: *Unerschütterlich bereit* and the sacred war lyrics *Gottes Sturmflut*. Rudolf Presber appears with a book of *Neue Kriegsgedichte*. The same patriotic note is voiced eloquently in Rudolf Alexander Schroeder's *Heilig Vaterland*, Max Dauthendey's *Des grossen Krieges Not*, Gustav Falke's *Unsere Helden*, Josef von Lauff's *Singenes Schwert*, Ludwig Ganghofer's *Eiserne Zither*, Will Veaspe's *Vom grossen Kriege 1914-15*, Richard Nordhausen's *Das Fähnlein licht an der Stange*, Karl Hans Strobl's *Eine gute Wehr und Waffen*, Katharina Botaky's *Ostpreussens Peuerzeit*, Rudolf Herzog's *Ritter, Tod und Teufel*, Hans Benzmann's *Kriegsgedichte für Kaiser und Reich*, and the *Kriegsgedichte und Feldpostbriefe* of Walter Heymann which were published after death had claimed him on the western battlefield. René Schickele, the Alsatian, avoids direct reference to the war in his little book of lyrics *Mein Herz, mein Land*. Emanuel Bodmann, however, entitles his volume *Mein Vaterland* and Alfons Petzold, the Austrian proletarian

poet, strikes a more humanitarian note in *Volk, mein Volk*, while his *Johanna* is a purely personal document. Other books of verse are Hermann Hesse's *Musik des Einsamen*, Kurt Martens's *Verse*, Marie Vaërtling's *Durstige Heckenrosen am Meer*, Robert Walser's *Kleine Dichtungen*, Karl Ernst Knodt's *Vom Bruder Tod*, Hans Schmidt-Kestner's *Gedichte*, Franz Werfel's *Einander*, and Börries von Münchhausen's *Alte und neue Balladen und Lieder*.

DRAMA. One of the strongest plays of the year is Emil Ludwig's historical drama *Friedrich, Kronprinz von Preussen*, dealing with the tragic youth of Frederick the Great and remarkable for the excellent portrayal of his friend Katte. Another historical drama is Dietrich Eckart's *Heinrich von Hohenstaufen*, and Julius Baumann has undertaken to dramatize scenes from the memoirs of Bismarck. Plays directly owing their inception to the war are *Des Kaisers Soldaten* by Hermann Essig, a drama of mobilization, Paul Enderling's *Ostpreussen*, Paul Ernst's *Preussengeist*, and Theodor Wundt's *Disziplin*, a three-act drama of soldier life. An interesting work is Carl Hauptmann's volume of one-act plays, entitled *Aus dem grossen Kriege*. The scene shifts from Silesia, where the watchman on the mountains first proclaims the news of war, to the western and eastern front and the dramatic climax is almost invariably accompanied by an outburst of patriotic song. Otto Burchard has chosen to make *Judith und Holofernes* the medium of his patriotic sentiment. Otto Steinbach has written a poetic drama: *Baldur's Tod*. Eduard Stucken, who a few years ago attracted attention by a poetic drama on a subject of mediæval lore, presents in *Die Hochzeit des Adrian Brouweis* a story of artist life, strong in details, but ineffective as a whole. Ernst Hardt, the one time winner of the Schiller prize through his *Tantris der Narr*, has sadly disappointed his admirers by his trivial treatment of an old familiar theme in his three-act drama *König Salomo*. Karl Schönherr, also a prize-winner of some years ago, scored a success with his five-act drama *Der Weibsteufel*. Franz von Königsbrunn has revised and adapted Otto Julius Bierbaum's *Fortuna*, a drama of adventure. Erich Oesterheld calls his play *Die einsamen Brüder* a sentimental comedy. Rudolf Hans Bartsch made an unsuccessful attempt at a problem play in the tragedy of a mother, *Ohne Gott*, while Marie Vaërtling's *Das Recht des Kindes* holds out promise of better work to come. A powerful first play was *Armut* by Anton Wildgans, an Austrian so far known only as the author of lyric verse of strong individuality. Herbert Eulenberg perseveres in courting the dramatic muse, but has not made a profound impression by his latest effort: *Der Frauenaustausch*. Felix Philippi has proved by *Der Fall Ravelli*, which is founded upon a criminal plot, that he has lost none of his clever constructive power. Hans Müller's *Die blaue Küste* failed to rouse the interest which his earlier work had called forth. The mood of the time does not make for comedy and only a few authors have attempted it. Hermann Bahr, the indefatigable, has written a farce: *Der muntre Seifensieder*. Siegfried Trebitsch, the translator of Shaw, calls his comedy *Gefährliche Jahre*, Ernst Kamnitzer has written *Die Nadel*, and Carl Sternheim figures as the author of two plays: *Die Scharmante* and *1913*. Heinrich Mohr has edited a

volume of two war farces: *Kriegsschwünke aus alter Zeit*.

CRITICISM, LITERARY HISTORY, ETC. The year has seen the publication of remarkably few important works of criticism. The most noteworthy are Erwin Rhode's *Der griechische Roman und seine Vorläufer*, Max Zobel von Zobeltitz's *Georg Büchner, sein Leben und Schaffen*, Dr. Otto Ritter's *Geschichte der französischen Balladenform*, Dr. Ernst Falk's *Das romantische Element in Prosper Mérimée's Roman und Novellen*. E. Heusermann is the author of a work on Schiller's dramas. Dr. Bruno Busse is the author of *Das Drama*, a work in three volumes, tracing the development of the drama from romanticism to the present time. Dr. Alois Brandl has embraced the occasion to allude to the England of to-day in the book entitled *Byron im Kampfe mit der englischen Politik und die englische Kriegerlyrik von heute*. Adolf Schafheitlin holds up the mirror to modernism in his *Lehrbuch des Lachens*. Thomas Mann has forsaken fiction for a serious and readable historical work: *Friedrich und die grosse Koalition*. Jacob Wassermann, too, has produced a historical volume of interest: *Deutsche Charaktere und Begebenheiten*. Julius Bab has written *Preussen und der deutsche Geist*.

BIOGRAPHY, MEMOIRS, LETTERS. Ricarda Huch is the author of a valuable study of the character of *Wallenstein*. Adolf Paul has published the memoir and letters of August Strindberg. Of Bismarck's biography there have been published several new editions. The *Letters of Johanna von Bismarck* have also been reissued. New editions of Goethe's correspondence with Marianne von Willemer and with Zelter are on the market. Theodor Storm's *Briefe an seine Braut* reflect the admirable personality of the poet-novelist. Josef Victor von Scheffel's *Briefe an Anton von Werner*, with annotations by the latter, are interesting reading. Wilhelm Bode has published a volume of *Stunden mit Goethe*, in which he collected Goethe's opinions of the French and English. Richard Wagner's *Autobiography* has appeared in a new edition.

TRAVEL. Alfons Pacquet, whose verse was inspired by various climes and derived much of his charms from his exotic subjects, has now written a book of travel in prose: *In Palästina*. Norbert Jacques, a Luxemburgian by birth, is the author of *Die Flüchtlinge*, in which he describes a journey through Holland behind the Belgian front. Hans Hoffman's *Länder und Leute* is another readable book of its kind. Hermann Bahr entitles an invitation to Salzburg: *Das österreichische Wunder*.

CURRENT EVENTS. So voluminous is the literature called forth by the war and so difficult to classify, that it is necessary to consider it separately. The author responsible for the greatest number of books of this kind is Dr. Hans F. Helmolt, who has written among other works, *Der Weltkrieg in Bildern und Dokumenten nebst einem Kriegtagebuch*, *Die geheime Vorgeschichte des Weltkrieges auf Grund urkundlichen Stoffes*, and a study of Bismarck, who is being referred to more and more frequently. The Wagnerites, too, have been busy airing their opinions, Houston Stewart Chamberlain having published a new volume of *Kriegsaufsätze*, and Hans von Wolzogen, *Gedanken zur Kriegszeit*. Of war diaries may be mentioned Dr. Artur Kutscher's *Kriegtagebuch*,

and Aage Madelung's *Mein Kriegstagebuch*, the work of a Danish author writing in German. Other works dealing with the campaign in the East or West are Karl Hans Strobl's *Zwischen Weichsel und Karpathen*; Artur Holitscher's *In England, Ostpreussen u. s. w.*; Adolf Koster's *Der Tod in Flandern*; Norbert Jacques's *London und Paris im Kriege*; Ludwig Ganghofer's *Reise sur Front 1915*; Alfons Pacquet's *Nach Osten*; Bernard Kellermann's *Der Krieg im Westen*; and *Kriegsfahrten eines Johanniters mit friedlichem Zwischenspiel*, by Fedor von Zobeltitz. The political aspects of the war are treated in Dr. Karl Notzel's *Der entlarvte Pan-slavismus und die grosse Aussöhnung der Slaven und Germanen*; Dr. Karl Federn in *Die Politik des Dreiverbandes und der Krieg*; Gustav F. Steffen in *Weltkrieg und Imperialismus*; Karl Bleibtreu in *Englands grosse Waterloo-lüge*; Alfons Pacquet in *Der Kaisergedanke*, and others. Otto Hauser, too, has turned from his purely literary labors to the all-engrossing problems of the day in *Rasse und Rassefragen in Deutschland*. The spirit of books like *Deutschland als Welternzieher*, by Johann August Lux, Friedrich Lienhard's *Deutschlands europäische Sendung*, and Walter von Molo's *Deutsch sein heisst Mensch sein*, is evident from the titles. Oskar A. G. Schmitz offers a forecast of the Germany that is to be after the war in *Das wirkliche Deutschland*. Karl Joel's *Neue Weltkultur*, Carl Hauptmann's *Die uralte Sphinx*, and Alexander Schneider's *Kriegsgestalten und Todesgewalten* are other interesting contributions to the literature of the war. Appreciations of the military leaders are numerous, among them *Unser Hindenburg*, by Paul Bliss, and *Von Hannibal zu Hindenburg*, by Karl Strecker. A contribution to the psychology of war is offered by Dr. Magnus Hirschfeld in *Warum hassen sich die Völker?* Friedrich Lienhard has written *Das deutsche Elsass*. A lighter note is struck by Hermann Bahr in *Kriegsregeln*, Eberhard Buchner in *Kriegshumor*, and Rudolf Greinz in *Die eiserne Faust: Martern auf unsere Feinde*. Women have contributed a number of books: Dr. Gertrud Bäumer, *Der Krieg und die Frau*, Leonore Niessen-Deiters, *Kriegsbriefe einer Frau*, and Lena Christ, *Unsere Bayern 1914*. The peace problem has been touched in Heinrich Lhotzky's *Um den Völkerfrieden*. More remotely related to the war are Peter Altenberg's *Feuchung*, Felix Poppenberg's *Der Sommerhut von 1915*, and the essays, *Wege und Umwege*, by Annette Kolb, who deserves credit for having publicly denounced the press for sowing hatred and creating national prejudices.

NEW EDITIONS. It is curious to note that neither Goethe nor Schiller is represented by as many new editions as in other years, Goethe's *Novellen und Märchen*, with an introduction by Paul Ernst being the only important addition. On the other hand, a writer whom the young generation had forgotten, if not deliberately ignored, has come into astonishing prominence: Emanuel Geibel, the singer of innocuous sentiment and hollow pathos. A volume of his lyrics has been reissued: *Heroldsrufe*, his drama *Sophonisbe*, and there are new complete editions of his poems and his dramas. Selections from the writings of Nietzsche have been published under the title *Nietzsche-Worte*. Selections from the writings of Richard Wagner are offered under the title, *Was ist deutsch?* There is

also a popular edition of Richard Wagner's *Complete Works*. The German tales by the Grimm brothers have made their annual reappearance in a new form. There have been new editions of Wilhelm Heinse's *Ardinghello oder die glückseligen Inseln*, of Gottfried August Bürger's poems in two volumes, of Clemens Brentano's *Geschichte vom braven Kasperl und schöner Annerl*, of Klaus Groth's letters on High and Low German, of the complete works of Heine and of Wildenbruch. It is not far to seek the reason of such reprints as the letters of Blücher, Fichte's *Über den Begriff des wahren Krieges*, selections from the writings of Görres under the title *Flammenszeichen*, the soldier and war stories of Johann Peter Hebel, and selections from the robust preachments of the worthy capuchin Abraham a Santa Clara, entitled *Kriegsbuch für die Seele*. The most attractive new edition is that of Gottfried Keller's *Heimat und Dichtung*, with drawings by Emil Bollmann.

TRANSLATIONS. Translations have been numerous. Among American authors so honored are Edgar Allan Poe, whose poems translated by Hedwig Lachmann and Hedda Möller-Bruck complete the German edition of his works. Only one American novel has appeared on the market: Meredith Nicholson's *House of a Thousand Candles*. The only English author represented is Conan Doyle. Paul Claudel, who had been introduced to the Germans by Emil Jacques-Dalcroze in the festival hall of his school at Dresden-Hellerau, is represented by his *Transfiguration*. Other French authors of whom translations have appeared are, Count Gobineau, Henri Bordeaux, Gustave Flaubert, Felicien Mallefille, and Le Sage. There are translations from the Danish of Holger Drachmann, Karin Michaelis, and Johannes V. Jensen; from the Norwegian of Knut Hamsun; and from the Swedish of Selma Lagerlöf. There is a new translation of the works of Sappho. *The Trojan Women* of Euripides has been translated by Franz Werfel. A collection of Chinese novels has appeared, and a volume of the memoirs of Li Hung Chang. The only book from the Turkish, Emin Mehmed's *Turks Awake*, seems a contribution to the literature of the war.

OBITUARY. Among the writers who have died within the past year are Albert Geiger, poet, novelist, and dramatist; Carl F. Glasenapp, the biographer of Wagner; Dr. Max Friedländer, editor of *Kladderadatsch*; Dr. Franz Schnorr von Carolsfeld, former director of the royal library at Dresden, and author of a history of *Meistergesang*; Käthe Sebaldt, who, under her pseudonym Miriam Eck, was known as a writer of lyrics and an excellent translator; Dr. Karl Lamprecht, the historian; Georg Busse-Palma, brother of Carl Busse, and, like him, a lyric poet; Felix Poppenberg, the essayist; Fritz Marti, the Swiss writer; and Walter Heymann, the lyric poet, one of a number of less known writers who fell on the battlefield.

GERMAN NEW GUINEA. A protectorate of Germany, including Kaiser-Wilhelmsland and the Bismarck Archipelago, with the German Solomon Islands. Estimated area, 240,000 square kilometers (92,664 square miles). Dependencies are the Caroline, Palau, Mariana, and Marshall islands; area, 2476 square kilometers (956 square miles). The total native

colored population of protectorate and dependencies is estimated at 600,000; other colored, 2000; whites, Jan. 1, 1913, 968 in the protectorate and 459 in the dependencies (of whom, German 746 and 259). Missions, four Protestant and five Roman Catholic. Schools, 516, with 18,486 pupils. The trade of the protectorate was valued at 5,299,000 marks imports, and 4,109,000 marks exports in 1911; in 1912, 5,872,000 and 5,041,000. The chief export is copra, amounting to 3,332,000 marks in 1911 and 4,052,000 in 1912. Imports from and exports to Germany in 1911, were valued at 2,554,000 and 3,330,000 marks; in 1912, 2,221,000 and 4,489,000. Imports and exports of the dependencies in 1911, 1,729,000 and 6,271,000 marks; in 1912, 1,963,000 and 5,164,000. The chief export is phosphate, valued at 5,308,000 marks in 1911, and 3,468,000 in 1912. Imports from and exports to Germany in 1911, 462,000 and 2,615,000 marks; in 1912, 441,000 and 1,613,000. Local revenue (for protectorate and dependencies) in 1912-13, 1,760,000 marks; in 1913-14, 2,096,000; expenditure, 3,410,000 and 3,830,000. The budget for 1914-15 balanced at 3,833,886 marks, the estimated receipts including an imperial contribution of 1,717,022 marks. The capital is Rabaul, in Neu-Pommern. A German protectorate was declared over Kaiser-Wilhelmsland and the Bismarck Archipelago in 1884; Germany acquired the dependencies in 1899.

In 1914 German New Guinea was occupied by British Colonial troops. See 1914 YEAR BOOK.

GERMAN PLOTS. See CANADA, *History*; and UNITED STATES AND THE WAR.

GERMAN REFORMED CHURCH. See REFORMED CHURCH IN THE UNITED STATES.

GERMAN SAMOA. A protectorate of Germany in the South Pacific, consisting of the islands of Savaii (652.9 square miles), Upolu (335.5), Manono (3.3), and Apolima (1.8). Total area, 993.5 square miles. Besides the islands mentioned there are several islets of inconsiderable area. Estimated native population, 38,000; whites, Jan. 1, 1913, 544, of whom 329 Germans. There is one Protestant and one Roman Catholic mission. Imports and exports increased from 2,826,000 and 1,770,000 marks respectively in 1907, to 3,462,000 and 3,534,000 in 1910, 4,066,000 and 4,390,000 in 1911, 4,994,000 and 5,045,000 in 1912, and 5,676,000 and 5,339,000 in 1913. The chief export is copra, valued at 4,070,000 marks in 1912 and 4,121,000 in 1913; next is cacao, 840,000 and 1,063,000. Imports from and exports to Germany in 1912, 986,000 and 2,536,000; in 1913, 1,199,000 and 2,973,000. Local revenue in 1912-13, 970,000 marks; in 1913-14, 1,190,000; expenditure, 1,130,000 and 1,138,000. The budget for 1914-15 balanced at 1,374,354 marks. The administrative headquarters is Apia, in Upolu.

In 1914 German Samoa was occupied by British Colonial troops. See 1914 YEAR BOOK.

GERMAN SOUTHWEST AFRICA. A protectorate of Germany on the Atlantic, between Angola and the Cape Province of the Union of South Africa (excepting Walfish Bay, which belongs to the Cape Province). Estimated area, 835,100 square kilometers (322,432 square miles), nearly equal to the combined area of Washington, Oregon, and California. Estimated native population, 81,000; other colored, 3000; whites, Jan. 1, 1913, 14,830, of whom 12,-

292 Germans. Missions, two Protestant and two Roman Catholic. Schools, 20, with 775 pupils; about 3000 persons are said to receive mission instruction. In 1912-13, 494 whites and 3194 natives were convicted in the courts. The military in 1914 numbered 1967 Germans and 589 natives; police, 516 and 370. The Germans, who established the protectorate in 1884, have met with much vigorous resistance from the natives. Stock raising exceeds agriculture in importance. The number of cattle increased from 73,331 in 1908 to 121,139 in 1910, 171,784 in 1912, and 205,643 in 1913. In the latter year there were also 53,691 wool sheep, 17,171 Persian sheep, 11,194 karakul, 472,585 mutton sheep, 485,401 goats, 31,503 Angora goats, 15,916 horses, 13,618 mules and asses, 7772 swine, 709 camels, and 1507 ostriches. Copper is mined and, in the neighborhood of Lüderitzbucht, diamonds are found in considerable quantities. The diamond output in 1910-11 was 814,322 carats, and in 1911-12, 766,465 carats. Imports and exports have been valued as follows: in 1907, 32,396,000 and 1,616,000 marks; in 1910, 44,344,000 and 34,692,000; in 1912, 32,499,000 and 39,035,000; in 1913, 43,426,000 and 70,302,000. Diamond export in 1912 and 1913, 30,414,000 and 58,910,000 marks; copper ore, 6,523,000 and 7,929,000 (in metric tons, 42,775 and 47,345); tin ore, 9000 and 632,000 (in metric tons, 9 and 209); hides and skins, 298,000 and 521,000; wool, 150,000 and 136,000; ostrich plumes, 97,000 and 125,000. Imports from and exports to Germany in 1911, 37,259,000 and 24,360,000 marks; in 1912, 26,442,000 and 32,454,000. The length of railway in operation increased from 20 kilometers in 1897 to 194 in 1900, 631 in 1905, 1598 in 1909, and 2104 (1307 miles) in 1912. Soon after the outbreak of the great war in 1914 the British decided for military purposes to connect the railway systems of the Union of South Africa and German Southwest Africa. The connecting line, completed in 1915, is 314 miles long, extending from Prieska, on the Orange River in the Cape Province, along the south bank of the river to a point opposite Upington, where the river is crossed; from Upington the line runs to Nakob and thence west to Kalkfontein, terminus of the railway from Lüderitzbucht.

Local revenue in 1912-13 and 1913-14, 31,910,000 and 23,500,000 marks; expenditure, 46,570,000 and 40,340,000; in addition, there were loans of 15,950,000 and 7,481,000 marks. The budget for 1914-15 balanced at 47,820,000 marks, estimated local receipts amounting to 28,199,000 marks, imperial contribution 12,140,000, and loan 7,481,000. Windhuk is the administrative headquarters.

HISTORY. Shortly after the outbreak of the war in 1914, the forces of the Union of South Africa under General Louis Botha began an invasion of German Southwest Africa. Two divisions of the Boer troops landed at Walfish and Lüderitz Bays and began to advance by rail from these points, while a third concentrated its strength in Northern Cape Colony and advanced northward. On Christmas Day (1914), Walfish Bay, which had been raided by the Germans in September, was reoccupied by the troops of the Union. The first action to take place in the new year was on January 5th, when the invading forces occupied Scuit Drift, a crossing place on the Orange River between South Africa and

German Southwest Africa. A week later another crossing place, Raman's Drift, was taken by the Boers. On January 14th, Swakopmund, the principal port of the Protectorate, was occupied. From this time the invasion proceeded rapidly. Town after town fell into the hands of the invaders. Early in February the Germans retaliated by attacking the South African town of Kakamas, but their attack was repulsed. The Union forces next occupied Garub, 70 miles inland from Lüderitz Bay, then Davignab, Nababas, Heiragobias, Ukamas, Jerusalem, and Velloor. On the last day of March, Aus, the southernmost port of the Protectorate, about 100 miles from Lüderitz Bay, was captured by the Boers. Following the occupation of Aus, the invaders took possession of Warmbad, the southern capital of the Colony, Kalkfontein and Kanus, important railway stations, Seeheim, Keetmanshoop, and Bethany. Kubas was taken without any fighting on May 1st, and Otyimbingue was occupied the following day. By May 6th, General Botha was in possession of Karibib, Johann Albrechtshohe, and Wilhelmstal, and on the 12th of the month he entered Windhuk, the capital of German Southwest Africa. Here the powerful wireless station of the Germans was captured. The capture of the capital meant the downfall of the Protectorate, but for some time the Germans continued to offer resistance. On June 21st General Botha occupied Omaruru, an important railroad station on the Swakopmund Railway, 80 miles northwest from Windhuk; several days later he captured Kalkfeld, 40 miles further north. Otjivarango and Okandyande were taken in the last days of the month. Okaputu was occupied on June 30th and Otavi on July 1st. The final stand of the Germans was made at Tsumeb. When this place fell on July 8th, the Protectorate was ready to surrender. The actual surrender was made on July 9th. By the terms of the agreement:

(1) The military forces of the Protectorate were surrendered by his Excellency Governor Seitz to the Right Honorable Louis Botha, Commandant-in-Chief of the forces of the Union.

(2) Officers of the army of the Protectorate were to be allowed to keep their arms after giving their parole.

(3) The active troops of the Protectorate were to be interned under such guard as the Union saw fit to propose.

(4) All reservists were allowed to return to their homes after giving their parole.

(5) All reservists among the prisoners were to be allowed to return home after giving their parole.

(6) All officers among the reservists were to be allowed to retain their arms after giving their parole.

(7) All officers of the active forces were to be allowed to keep their mounts.

(8) All police of the Protectorate who had been acting in the capacity of soldiers were to be treated as such. Those acting in distant parts of the Protectorate were to be allowed to remain until such time as they could be replaced by the Union.

(9) Civil officers of the Protectorate were to be allowed to remain in their home after giving their parole.

(10) All war material, except the arms re-

tained by the officers, were to be placed at the disposal of the Union.

(11) Civil and military officials were to be appointed to keep a record of all property handed over to them.

The surrender of the Protectorate was speedily followed by the submission of the scattered German forces still remaining under arms in Damaraland and in remoter districts, so that by the end of July, the entire territory of German Southwest Africa was in the control of the Boer forces. See also WAR OF THE NATIONS, Africa.

GERMANY. The German Empire, officially *das Deutsche Reich*, a constitutional monarchy, consists of 25 federated states and an Imperial territory (Reichsland). Capital, Berlin.

AREA AND POPULATION. The area is officially stated at 540,857.5 square kilometers, equivalent to 208,825.2 square miles. This area is only slightly greater than that of France, 207,129 square miles, and is about the same as the combined areas of Nevada and Wyoming, 208,604 square miles, or of Maine, New Hampshire, Vermont, Massachusetts, Connecticut, New York, New Jersey, Pennsylvania, and Ohio, 208,770 square miles. The area in square miles, and the population according to the census of Dec. 1, 1900, and the census of Dec. 1, 1910, are shown by states in the following table (*k* kingdom, *g* grand duchy, *d* duchy, *p* principality, *fc* free city, *r* Reichsland); under Prussia are shown the constituent provinces and territory of Hohenzollern, and under Bavaria are shown Bavaria proper (that is, the eastern part) and the detached Palatinate (west of the Rhine).

	Sq. m.	Pop. 1900	Pop. 1910
Prussia (<i>k</i>)	134,663.9	34,472,509	40,165,219
East Prussia	14,286.5	1,996,626	2,064,175
West Prussia	9,866.7	1,563,658	1,703,474
Berlin (city)	24.5	1,888,848	2,071,257
Brandenburg	15,383.1	3,108,554	4,092,616
Pomerania	11,633.7	1,634,832	1,716,921
Posen	11,193.6	1,887,275	2,099,831
Silesia	15,373.4	4,668,857	5,225,962
Saxony	9,755.7	2,832,616	3,089,275
Schleswig-Holstein	7,843.2	1,387,968	1,621,004
Hanover	14,868.5	2,590,939	2,942,436
Westphalia	7,806.8	3,187,777	4,125,096
Hesse-Nassau	6,062.5	1,897,981	2,221,021
Rhine Province	10,424.8	5,759,798	7,121,140
Hohenzollern	441.0	66,780	71,011
Bavaria (<i>k</i>)	29,293.5	6,176,057	6,887,291
Bavaria proper	27,004.7	5,844,379	5,950,206
Palatinate	2,228.8	831,678	987,085
Saxony (<i>k</i>)	5,788.8	4,202,216	4,806,661
Württemberg (<i>k</i>)	7,531.8	2,169,480	2,437,574
Baden (<i>g</i>)	5,818.6	1,867,944	2,142,833
Hesse (<i>g</i>)	2,969.5	1,119,893	1,282,051
Mecklenburg-Schwerin (<i>g</i>)	5,068.3	607,770	639,958
Saxe-Weimar (<i>g</i>)	1,393.8	362,873	417,149
Mecklenburg-Strelitz (<i>g</i>)	1,131.1	102,602	106,442
Oldenburg (<i>g</i>)	2,482.3	399,180	483,042
Brunswick (<i>d</i>)	1,417.8	464,333	494,839
Saxe-Meiningen (<i>d</i>)	952.8	250,731	278,762
Saxe-Altenburg (<i>d</i>)	511.0	194,914	216,128
Saxe-Coburg-Gotha (<i>d</i>)	763.2	229,550	257,177
Anhalt (<i>d</i>)	887.8	316,085	331,128
Schwarzburg-Sondershausen (<i>p</i>)	332.9	80,898	89,917
Schwarzburg-Rudolstadt (<i>p</i>)	363.0	93,059	100,702
Waldeck (<i>p</i>)	432.8	57,918	61,707
Reuss Elder Line (<i>p</i>)	122.1	68,396	72,769
Reuss Younger Line (<i>p</i>)	319.2	139,210	152,752
Schaumburg-Lippe (<i>p</i>)	131.4	43,132	46,652
Lippe (<i>p</i>)	469.4	138,952	150,937
Lübeck (<i>fc</i>)	114.9	96,775	116,599

	Sq. m.	Pop. 1900	Pop. 1910
Bremen (fc)	99.0	224,882	229,526
Hamburg (fc)	160.0	768,849	1,014,664
Alsace-Lorraine (r)	5,606.9	1,719,470	1,874,014
Total	208,825.2	56,867,178	64,925,998

POPULATION TOTALS OF THE EMPIRE IN FORMER YEARS				
Total	1905	60,641,489	1860	37,747,000
Total	1900	56,867,178	1850	35,897,000
Total	1890	49,428,470	1840	32,787,000
Total	1880	45,284,061	1830	29,520,000
Total	1871	41,058,792	1820	26,294,000
Total	1870	40,818,000	1816	24,838,000

The population totals for former years given above are comparable, since they relate to the Empire as constituted at present. The increase from 1871 to 1880 amounted to about 10.8 per cent; from 1880 to 1890, 8.9; from 1890 to 1900, 13.1; from 1900 to 1910, 14.1; from 1871 to 1910, 58.1. The average density per square mile in 1871 was about 197, and in 1910 about 311.

The estimated population of the Empire, and of the customs territory (Zollgebiet) respectively, on June 30, 1912, was 66,146,000 and 66,391,000; on June 30, 1913, 66,978,000 and 67,225,000; on June 30, 1914, 67,810,000 and 68,059,000.

The 1910 census returned 32,040,166 males and 32,885,827 females. The number of males 18 years old and over was 18,947,561, and of females, 19,906,644. In view of the war, it is interesting to note the number of males returned by the 1910 census as having been born between the years 1879 and 1894 inclusive, that is, the number of males who, barring deaths from Dec. 31, 1910, would have been from 20 to 35 years of age in 1914; this number was 6,305,901. Males born in the years 1874 to 1878 inclusive, that is, males, who, barring deaths, would have been from 36 to 40 years of age in 1914, numbered 2,345,218. Males born in 1895 and 1896 numbered 1,329,903 at the 1910 census. Thus the number of males who, barring deaths from the end of 1910, would have been from 18 to 40 years of age in 1914 was 9,981,022. Of the total population in 1910, unmarried males and unmarried females numbered 19,516,340 and 18,591,604 respectively; married, 11,608,028 and 11,621,685; widowed, 866,676 and 2,583,872; divorced or separated, 49,122 and 88,666.

The 1900 census showed a foreign population of 778,737, of whom 314,463 female; the 1910 census, 1,259,880, of whom 542,991 female. Of the total in 1910, Austrians numbered 634,989, Dutch 144,181, Russians (including Finns) 137,668, Italians 104,265, Swiss 68,233, Hungarians 32,087, Danes 26,238, French (including colonials) 19,137, British (including colonials) 18,319, Americans (including Filipinos, Porto Ricans, and Hawaiians) 17,555, Luxemburgois 14,356, Belgians 13,449.

The increase in population is largely urban. Communes having less than 2000 inhabitants are regarded as rural. The aggregate population of such communes in 1871 was 63.9 per cent of the total; in 1890, 53.0 per cent; in 1900, 45.6 per cent; in 1910, 40.0 per cent. The aggregate population of communes having 100,000 or more inhabitants in 1871 was 4.8 per cent of the total; in 1890, 12.1; in 1900, 16.2; in 1910, 21.3. On Dec. 1, 1910, there were 576 communes with over 10,000 inhabitants each. The communal population of the

larger cities at that time was as follows (some of the figures are larger than the returns of the census, having been adjusted so as to include certain districts subsequently annexed): Berlin, 2,071,257 (Greater Berlin, 3,710,000); Hamburg, 932,116; Leipzig, 626,287; Munich, 607,592; Dresden, 551,697; Cologne, 516,527; Breslau, 514,765; Frankfurt on the Main, 414,576; Düsseldorf, 358,728; Nuremberg, 333,142; Charlottenburg, 305,978; Hanover, 302,375; Essen, 294,653; Chemnitz, 287,807; Stuttgart, 286,218; Magdeburg, 279,629; Bremen, 247,437; Königsberg, 245,994; Stettin, 237,419; Neukölln (formerly Rixdorf), 237,289; Duisburg, 229,483; Dortmund, 214,226; Kiel, 211,627; Mannheim, 206,049; Halle, 180,843; Strassburg, 178,891; Berlin-Schöneberg, 172,823; Altona, 172,628; Danzig, 170,337; Elberfeld, 170,195; Gelsenkirchen, 169,513; Barmen, 169,214; Posen, 156,691; Aachen (Aix-la-Chapelle), 156,143; Cassel, 153,196; Brunswick, 143,552; Augsburg, 143,128; Bochum, 136,931; Karlsruhe, 134,313; Lichtenberg, 133,141; Krefeld, 129,406; Erfurt, 123,548; Plauen, 121,272; Mainz, 118,107; Mülheim on the Ruhr, 112,580; Berlin-Wilmersdorf, 109,716; Lübeck, 109,106; Wiesbaden, 109,002; Saarbrücken, 105,089; Mülhausen (in Alsace), 105,448; Hamborn, 101,703; Münster (in Westphalia), 90,254; Oberhausen, 89,900.

Of the total population at the 1910 census, about 61.6 per cent was returned as Evangelical and 36.7 per cent as Roman Catholic, as compared with 62.5 per cent and 36.1 per cent in 1900. In 1910, Evangelicals numbered 39,991,421, Roman Catholics 23,821,453, other Christians 283,946, Jews 615,021, others 214,152. The following table shows, according to the 1910 census, the number of Evangelicals (*E.*), of Roman Catholics (*R. C.*), of other Christians (*O. C.*), and of Jews (*J.*), per thousand inhabitants:

	<i>E.</i>	<i>R. C.</i>	<i>O. C.</i>	<i>J.</i>
Prussia	618.2	363.1	4.7	10.4
Bavaria	282.1	706.1	2.0	8.0
Saxony	940.5	49.1	5.3	8.7
Württemberg	685.6	303.6	5.3	4.9
Baden	385.6	598.2	6.2	12.1
Hesse	661.5	810.1	5.2	18.8
Mecklenburg-Schwerin	961.8	82.9	2.0	2.2
Saxe-Weimar	944.0	47.9	2.0	3.2
Mecklenburg-Strelitz	953.7	40.0	3.3	2.4
Oldenburg	769.4	222.6	3.3	3.2
Brunswick	939.0	52.4	8.6	3.6
Saxe-Meiningen	973.7	18.8	2.2	4.1
Saxe-Altenburg	961.6	33.5	2.2	0.9
Saxe-Coburg-Gotha	973.9	19.3	1.2	3.0
Anhalt	952.1	38.5	3.3	4.2
Schwarzburg-Sondershausen	976.9	19.3	0.6	2.4
Schwarzburg-Rudolstadt	985.2	12.8	0.8	0.8
Waldeck	936.9	46.3	6.4	9.6
Reuss Elder Line	968.7	17.8	11.9	0.6
Reuss Younger Line	964.1	22.9	5.1	2.5
Schaumburg-Lippe	951.4	15.3	28.2	4.9
Lippe	953.8	39.3	1.3	5.2
Lübeck	956.6	84.0	2.4	5.4
Bremen	967.0	74.2	4.3	6.2
Hamburg	916.8	50.3	4.2	19.2
Alsace-Lorraine	217.8	762.2	2.1	16.8
Total	615.9	366.9	4.4	9.5

From 1906 to 1913 (the latest year for which vital statistics are available), a decline is noticeable in the marriage rate, the birth rate, and the death rate. In 1912 and 1913 respectively, marriages numbered 523,491 and 513,283; births (including stillbirths), 1,925,883 and 1,894,598; deaths (including stillbirths),

1,085,996 and 1,060,798; excess of births, 839,887 and 833,800; living births, 1,869,636 and 1,838,750. The following table shows for each 1000 inhabitants: *m* the number of marriages; *b* births (including stillbirths); *d* deaths (including stillbirths); *e* excess of births over deaths; *l* living births; and for each 100 births: *i* the number of illegitimate births; *s* the number of stillbirths:

	<i>m</i>	<i>b</i>	<i>d</i>	<i>e</i>	<i>l</i>	<i>i</i>	<i>s</i>
*1851-60	7.8	36.8	27.8	9.0	35.8	11.5	4.0
1871-80	8.6	40.7	28.8	11.9	39.1	8.9	4.0
1881-90	7.8	38.2	26.5	11.7	36.8	9.3	8.7
1891-1900	8.2	37.3	28.5	18.9	36.1	9.1	8.2
1901-1910	8.0	38.9	19.7	14.3	32.9	8.6	8.0
1900	8.5	36.8	23.2	13.6	36.6	8.7	3.1
1905	8.1	34.0	20.8	13.2	33.0	8.5	3.0
1910	7.7	30.7	17.1	13.6	39.8	9.1	2.9
1911	7.8	29.5	18.2	11.3	28.6	9.2	2.9
1912	7.9	29.1	16.4	12.7	28.3	9.5	2.9
1913	7.7	28.3	15.8	12.4	27.5	9.7	2.9

* For the ten-year periods, the annual average is shown.

In 1895 German overseas emigrants numbered 37,498, and foreign emigrants from German ports, 95,074; in 1900, 22,309 and 160,129; in 1905, 28,075 and 284,787; in 1910, 25,531 and 254,618; in 1911, 22,690 and 183,233; in 1912, 18,545 and 290,386; in 1913, 25,843 and 413,857; in 1914, 11,803 and 150,416. Of the German emigrants in 1914, 9614 were bound for the United States, 77 for Brazil, 1821 for other American countries, 232 for Australia, 8 for Africa. Of the foreign emigrants from German ports in 1914, 131,938 were bound for the United States, 16,077 for other American countries, 2075 for the United Kingdom, 223 for Africa.

EDUCATION. Higher schools for males numbered, in 1911, 1687, with 22,941 teachers and 427,644 students; for females, 828, with 3012 male teachers, 9386 female teachers, and 234,461 students (not including 2051 boys under instruction at the girls' schools). Included in the higher schools for males were: 534 gymnasia, with 9769 teachers and 160,237 students; 223 realgymnasia, with 3708 teachers and 70,357 students; 167 oberrealschulen, with 3473 teachers and 75,832 students; 81 progymnasia, with 570 teachers and 9509 students; 63 prorealgymnasia, with 384 teachers and 7252 students; and 411 realschulen, with 4265 teachers and 89,968 students. Of the higher schools for females, 39 were gymnasia, with 432 male teachers, 607 female teachers, and 22,137 students. There are numerous institutions for higher, technical, and professional instruction. Degree-conferring technical high schools number 11, at Aachen, Berlin, Breslau, Brunswick, Danzig, Dresden, Hanover, Karlsruhe, Munich, and Stuttgart. These technical high schools, in the winter semester of 1913-14, had 11,594 regular students, while the total enrollment, including attendants upon lectures, etc., was 16,871, of whom 1877 were females. In the winter semester of 1914-15, regular students numbered 9725, and the total enrollment was 11,722, of whom 842 were females. Lyceums, with faculties of philosophy and Roman Catholic theology, are established at Bamberg, Brunswick (academy), Dillingen, Eichstätt, Freising, Passau, and Regensburg; these had, in the winter semester of 1914-15, 847 regular students, and a total enrollment of 957, of whom 26 were females. The 21 univer-

sities, together with the Kaiser-Wilhelm Academy at Berlin, and the Posen Academy, had, in the winter semester of 1912-13, 59,312 matriculated students (including 3213 females), and a total enrollment of 69,277 (including 5316 females); in the winter semester of 1913-14, 60,095 matriculated students (3686 females), and a total enrollment of 70,024 (5518 females); in the winter semester of 1914-15, 53,074 matriculated students (3896 females), and a total enrollment of 56,644 (4842 females). The first semester of the newly established University of Frankfurt on the Main, was that of the winter 1914-15; the number of the students is included in the total just given. The decline in attendance at the technical high schools and universities is to be noted as one of the results of the war. The following table shows for the several universities the number of matriculated students and the total enrollment in the winter semesters of 1913-14 and of 1914-15:

	1913-14		1914-15	
	Matric.	Total	Matric.	Total
Berlin	9,593	14,211	8,085	9,308
Kaiser-Wilhelm Academy	494	494	504	504
Bonn	4,270	4,550	4,357	4,481
Breslau	2,791	3,280	2,709	3,000
Frankfort on the Main	.....	.....	618	1,009
Göttingen	2,815	2,941	2,263	2,814
Greifswald	1,250	1,899	1,109	1,151
Halle	2,910	3,108	2,312	2,359
Kiel	1,847	1,923	1,941	1,971
Königsberg	1,568	1,675	1,260	1,281
Marburg	2,168	2,217	2,049	2,062
Münster	2,123	2,297	2,361	2,456
Posen (Academy)	.....	830	.....	163
Munich	6,802	7,664	5,539	5,833
Würzburg	1,515	1,586	1,208	1,227
Erlangen	1,341	1,388	1,118	1,186
Leipzig	5,532	6,463	4,515	4,933
Tübingen	1,887	2,013	2,056	2,114
Heidelberg	2,409	2,567	2,028	2,091
Freiburg in Breisgau	2,572	2,710	2,237	2,276
Gießen	1,340	1,514	1,214	1,248
Jena	1,862	1,944	1,166	1,708
Rostock	814	1,009	820	839
Strassburg	2,092	2,241	1,155	1,180
Total	60,095	70,024	53,074	56,644

In the winter semester of 1914-15, the number of matriculated university students in the several faculties was as follows: Evangelical theology, 4018 (including 12 females); Roman Catholic theology, 1888; law, 8561 (including 71 females); medicine, 15,149 (985); philosophy (including science, etc.), 22,419 (2739). The theological faculties at Münster, Munich, Würzburg, and Freiburg are Roman Catholic; at Bonn, Breslau, Tübingen, and Strassburg, there are both Roman Catholic and Evangelical theological faculties; at the other universities, the theological faculties are Evangelical. There are many institutions, in addition to those mentioned, for technical and special instruction.

AGRICULTURE. The total area of Germany is stated at 54,085,760 hectares. So-called farm land in 1907 (the latest year for which statistics are available) comprised 43,106,486 hectares. Of this land 31,834,874 hectares (73.9 per cent) were under cultivation, 7,679,754 hectares (17.8 per cent) were profitable forest, and 3,591,858 hectares (8.3 per cent) were poor pasture, waste lands, yards, etc. Land under cultivation consisted of arable land, 24,432,354 hectares (56.7 per cent of the total farm land); meadows and sown pastures, 6,805,436 hectares (15.8 per cent); gardens, 481,716 hectares (1.1 per cent); and vineyards, 115,368 hectares (0.3

per cent). As compared with 1895, the year 1907 showed an increase in waste and forest land and a slight decrease in cultivated land. In 1907, about 28 per cent of the population were supported by agriculture, as compared with about 35 per cent in 1895.

For some of the principal crops, the area, in thousands of hectares, and the yield, in metric tons, are reported as follows:

	1000 hectares			Metric tons	
	1912	1913	1914	1913	1914
Wheat	1,925	1,974	1,996	4,655,956	3,971,995
Rye	6,268	6,414	6,299	12,222,394	10,426,718
Barley	1,590	1,654	1,582	3,673,254	3,187,983
Oats	4,387	4,438	4,388	9,713,965	9,038,185
Potatoes	3,342	3,412	3,386	54,121,146	45,569,559

On account of the war, figures for the 1915 crops are not available. In 1913, about 533,000 hectares were planted to sugar beets, yielding 16,939,979 metric tons; in 1914, 569,082 hectares, 16,918,782 metric tons. The output of raw sugar in 1913 was 2,706,327 metric tons; in 1914, 2,617,938 (provisional figure). In 1913 and 1914 respectively, 27,048 and 27,685 hectares were under hops; yield, 106,179 and 232,366 metric quintals. The average yield of hops in 1905-14 was 192,307 quintals. The area under vines is gradually declining, from 119,873 hectares in 1904 to 105,876 in 1913, and 102,855 in 1914; the yield varies greatly, having been 7.5 hectolitres per hectare in 1910, 26.6 in 1911, 18.6 in 1912, and 9.5 in 1913. The total yield of wine in the latter year was 1,004,947 hectolitres. The average yield in 1905-9 was 2,628.034 hectolitres.

Live stock has been enumerated as follows on December 1st, the figures for horses not including those used in the army and the 1914 figures being provisional:

	1904	1913	1914
Horses	4,267,403	.....	3,441,307
Cattle	10,456,187	11,320,460	11,316,457
Sheep	7,907,173	5,520,837	5,451,570
Swine	18,920,666	25,659,140	25,339,850
Goats	3,329,881	3,548,884	3,534,327

FISHERIES. Fishing in 1914 was interrupted by the war, and statistics for that year have not been issued. The value of the North Sea catch in 1912 and 1913 respectively was: fish, 21,241,700 marks and 21,857,200 marks; shellfish, 798,400 and 962,200; other marine animals, 6700 and 5700; salt herring and other fishery products, 8,937,800 and 11,786,100; total, 30,984,600 and 34,811,200. Value of the Baltic catch, including that of the bays (Stettiner Haff, etc.), in 1912 and 1913: fish, 10,554,500 marks and 10,341,100 marks; shellfish, 2900 and 6100; other animals regarded as marine (chiefly wild ducks), 24,700 and 31,000; total, 10,582,100 and 10,378,200. Total value of North Sea and Baltic catches in 1912 and 1913, 41,566,700 and 44,989,400 marks.

MINERALS AND METALS. The output of the grand duchy of Luxemburg is included in the statistics of Germany. The value of the mineral output in 1912 is stated at 2369 million marks, as compared with 2086 million in 1911, and 2009 million in 1910. The production of the principal minerals in 1912 and 1913 are reported as follows, in thousands of metric tons: coal, 174,875 and 190,109; lignite, 80,935 and

87,233; iron ore, 27,200 and 28,608; zinc ore, 644 and 642; lead ore, 143 and 110; copper ore, 974 and 948; rock salt, 1296 and 1392; potassium salts, 11,161 and 13,306. The output of pig iron in 1911 and 1912 is reported at 15,574,039 and 15,220,900 metric tons respectively; zinc, 243,784 and 313,600; lead, 161,450 and 165,000; copper, 37,455 and 45,500; tin, 12,426 and 10,600; sulphuric acid, 1,724,081 and 1,649,700. For 1913, the total output of pig iron was reported at 19,291,920 metric tons; for 1914, 14,389,547.

COMMERCE. The German customs territory includes the grand duchy of Luxemburg. On account of the war, commercial statistics for 1914 have not been published. For 1913 and preceding years, total foreign commerce, except goods in transit, is shown below, in millions of marks:

	1910	1911	1912	1913
Imports:				
Merchandise	9,585.1	10,380.0	11,572.4	11,654.8
Coin and bullion . .	555.0	297.3	327.4	441.3
Total	10,090.1	10,677.3	11,899.8	12,096.1
Exports:				
Merchandise	9,535.1	10,880.0	11,572.4	11,654.8
Coin and bullion . .	352.9	118.3	142.9	102.8
Total	8,432.6	8,892.2	9,827.1	10,994.6

Imports for consumption and exports of German produce have been valued as follows, in millions of marks:

	1910	1911	1912	1913
Imports:				
Merchandise	8,934.1	9,705.7	10,691.8	10,769.7
Coin and bullion . .	375.9	301.3	325.7	436.4
Total	9,310.0	10,007.0	11,017.5	11,206.1
Exports:				
Merchandise	7,474.7	8,106.1	8,956.8	10,097.2
Coin and bullion . .	169.5	118.3	142.7	101.4
Total	7,644.2	8,224.4	9,099.5	10,198.6

In 1912 and 1913, imports and exports of merchandise, special trade, were valued by great classes as follows, in millions of marks:

	Imports		Exports	
	1912	1913	1912	1913
Raw materials . . .	4,823.2	5,003.0	1,382.4	1,518.1
Partly mfd.	1,256.8	1,239.0	1,012.9	1,139.4
Manufactures . . .	1,410.9	1,487.8	5,763.2	6,896.8
Food substances . .	2,944.9	1,759.2	789.4	1,036.0
Live animals . . .	256.0	289.7	8.9	7.4
Total	10,691.8	10,769.7	8,956.8	10,097.2

For 1912 and 1913 respectively, the values in millions of marks, of the principal imports of merchandise for consumption, were as follows: cereals, 1130.5 and 1037.0; hides and skins, 575.5 and 672.4; cotton, 623.6 and 664.1; wool, 527.0 and 511.7; chemicals and drugs, 395.4 and 421.8; copper, 320.0 and 346.7; timber, lumber, etc., 355.5 and 325.5; live animals, 252.9 and 201.6; coal, 275.7 and 280.6; iron, 213.3 and 238.3; copra, coconuts, etc., 195.3 and 225.9; coffee, 252.7 and 219.7; silk, 229.9 and 193.3; eggs, 187.5 and 188.2; fruits, 126.0 and 148.8; rubber and gutta-percha, 184.2 and 146.1; fish, 126.5 and 135.9; leaf tobacco, 135.6 and 134.3; wheat products, 186.8 and 130.3; linseed, 104.8 and 129.7; animal fats, 111.2 and 118.9; butter, 126.3 and 118.7; oilcake, 116.5

and 118.6; cotton yarn, 104.0 and 116.2; flax and hemp, 120.4 and 114.4; woolen yarn, 107.6 and 108.0; rice, 102.6 and 103.9; southern fruits, 94.2 and 101.2; tin, 107.2 and 101.1; jute, 74.7 and 94.0; iron manufactures, 97.9 and 93.7; meats, 84.8 and 81.4; machinery 77.1 and 80.4.

For 1912 and 1913 respectively, the values, in millions of marks, of the principal exports of domestic produce were as follows: iron manufactures, 1185.8 and 1337.6; coal, 611.9 and 722.6; machinery, 630.3 and 680.3; chemicals and drugs, 546.4 and 658.0; cotton goods, 421.6 and 446.5; cereals, 341.6 and 278.2; paints, dyes, colors, etc., 278.2 and 298.1; electrical apparatus, 239.7 and 290.3; woolen goods, 253.4 and 270.9; sugar, 132.2 and 266.6; paper, 232.2 and 262.8; leather, 230.1 and 242.9; copper manufactures, 184.7 and 240.7; silk goods, 205.2 and 219.5; furs, etc., 182.2 and 193.8; hides and skins, 182.3 and 178.4; ships, 155.9 and 175.2; woolen yarn, 84.2 and 166.3; glass and glassware, 119.5 and 146.1; apparel, 118.3 and 132.0; rubber manufactures, 120.5 and 128.3; leather manufactures, 98.1 and 114.2; pottery, 102.0 and 112.8.

The value of imports of merchandise for consumption and of exports of domestic produce by countries in 1912 and 1913 was as follows, in millions of marks:

	Imports		Exports	
	1912	1913	1912	1913
United States	1,586.0	1,711.5	697.6	713.2
Russia	1,527.9	1,424.6	679.8	880.0
United Kingdom	842.6	876.1	1,161.1	1,438.2
Austria-Hungary	830.0	827.3	1,035.3	1,104.8
France	552.2	584.2	689.4	789.9
British India	533.3	541.8	107.5	150.7
Argentina	444.9	494.5	239.4	265.9
Belgium	386.6	344.6	493.3	551.0
Netherlands	345.4	338.0	608.5	693.5
Italy	304.6	317.7	401.2	393.5
Australia	276.7	296.1	87.6	88.5
Brazil	313.2	247.9	192.8	199.8
Du. E. Indies	214.9	227.6	74.5	98.6
Sweden	214.0	224.1	197.4	229.8
Switzerland	205.7	213.3	520.5	536.1
Chile	209.7	199.8	112.0	97.8
Spain	189.8	198.7	113.0	143.0
Denmark	202.2	191.9	254.2	283.9
Br. W. Africa	118.6	134.5	15.2	16.7
China	115.6	130.0	81.7	122.8
Egypt	117.7	118.4	88.0	43.4
Norway	63.9	82.0	144.7	161.7
Rumania	138.2	79.8	131.7	140.0
Turkey	77.8	73.9	113.2	98.4
U. of S. Africa	67.2	69.6	44.5	46.9
Br. N. America	58.1	64.1	54.3	60.5
Japan	43.1	46.6	110.6	122.7
Finland	36.9	45.2	83.4	97.5

Total including other 10,691.8 10,769.7 8,956.8 10,097.2

By Imperial orders dated July 31, 1914, the export of wheat, wheat flour, rye, barley, oats, maize, rice, and cotton from that date, and of linseed from August 19th, was prohibited. Exceptions might be granted.

SHIPPING. Number and registered tonnage (metric) of vessels entered and cleared at the ports, in the foreign trade, in 1913:

	Vessels entered		Vessels cleared	
	No.	Tons	No.	Tons
German	89,829	21,281,342	90,456	21,276,587
Foreign	26,637	15,540,835	26,919	13,645,219
Total	116,466	36,822,177	117,375	34,921,806
1912	114,407	32,541,458	113,931	32,606,653
1903	90,829	20,886,048	91,510	20,978,515
1898	66,655	14,621,634	67,219	14,734,653

Number and tonnage of steam vessels included in the 1913 figures above:

	Vessels entered		Vessels cleared	
	No.	Tons	No.	Tons
German	59,900	18,596,837	60,392	18,618,425
Foreign	16,651	12,710,212	16,751	12,802,919
Total	76,551	31,307,049	77,143	31,421,344
1912	73,079	29,001,122	74,025	29,046,505
1908	53,362	18,268,823	53,574	18,348,669
1898	31,032	12,406,770	31,189	12,482,780

Of the foreign shipping entered in 1913, British vessels numbered 5285, of 6,178,714 tons; Swedish, 5931, of 2,172,577 tons; Danish, 8101, of 1,703,232 tons; Norwegian, 2184, of 1,356,681 tons; Dutch, 3635, of 1,022,585 tons; Finnish, 512, of 207,215 tons; Russian, 517, of 197,031 tons.

Of the total in 1913 there were entered at Hamburg 14,054 vessels, of 13,141,362 tons; at Bremerhaven, 1803, of 2,298,689 tons; at Bremen, 3310, of 1,928,950 tons; at Stettin, 4900, of 1,893,434 tons; at Rostock (Warnemünde), 3423, of 1,409,908 tons; at Cuxhaven, 1777, of 1,305,900 tons; at Sassnitz, 3277, of 1,235,117 tons; at Lübeck, 4047, of 958,239 tons; at Neufahrwasser (Danzig), 2811, of 781,498 tons; at Emden, 1870, of 779,031 tons.

The table below shows the number of vessels, with their registered net tonnage, comprising Germany's merchant marine Jan. 1, 1914 (excluded are steamers of less than 15 tons and sail of less than 22 tons):

	Vessels		Of which, steam	
	No.	Tons	No.	Tons
Hamburg	1,466	1,908,279	822	1,640,828
Bremen	713	937,610	461	810,275
Prussia	2,329	3,18,646	687	251,924
Oldenburg	298	60,476	80	37,288
Lübeck	54	49,153	53	48,376
Mecklenburg-Schwerin	75	45,907	67	43,671
Recapitulation:				
North Sea	3,948	2,988,216	1,587	2,520,609
Baltic Sea	987	381,855	583	311,708
Total	4,935	3,320,071	2,170	2,832,312
1913	4,850	3,153,724	2,098	2,655,496
1912	4,732	3,023,725	2,009	2,518,666
1901	3,883	1,941,645	1,390	1,347,875

COMMUNICATIONS. The following table shows the length in kilometers of state and private normal-gauge railway in operation, together with the average number of kilometers of railway per thousand square kilometers of area, as officially reported for March 31, 1913:

	State	Private	Total	Aver.
Prussia	35,303.1	2,209.8	37,510.4	107.5
Bavaria	8,115.3	241.9	8,357.2	110.2
Saxony	2,656.4	20.2	2,676.6	178.5
Württemberg	1,811.1	162.5	1,973.6	102.2
Baden	1,856.0	235.7	2,091.7	138.8
Hesse	1,363.3	130.2	1,493.5	194.3
Mecklenburg-Schwerin	1,157.1	9.1	1,166.2	88.8
Saxe-Weimar	409.9	51.1	461.0	127.7
Mecklenburg-Strelitz	160.0	121.3	281.5	96.0
Oldenburg	644.1	40.8	684.9	106.5
Brunswick	439.5	208.3	647.8	176.4
Alsace-Lorraine	1,822.1	15.6	1,837.7	126.6
Total including other	57,505.7	3,653.1	61,158.8	118.1
1912	56,859	3,662	60,521	111.9
1911	56,062	3,701	59,762	110.5
1910	55,353	3,678	59,031	109.1
1905	50,514	4,166	54,680	100.9

* In addition 352.3 km. abroad, belonging to the German state railways.

Besides the normal-gauge railway shown in the foregoing table, there were in operation on March 31, 1913, 2218.5 kilometers of narrow-gauge railway, of which 1075.3 kilometers were state railway and 1143.2 kilometers private.

The railway service in Germany during 1915, and in the previous year, was handled under military conditions. The German government maintained a complete military organization of its railway lines, and construction was primarily for strategic purposes and military operations. From the time that war was declared on Aug. 2, 1914, the mobilization of the troops was effected rapidly by railway service which included not only the actual moving of military units, but also bringing men to their homes or appointed places, while at the same time a large number of tourists were transported to frontiers or elsewhere.

The early movements of the railway lines included the elimination of loading and unloading freight cars that were not needed for the transport of military material. The operation of troop trains began a few hours after the actual mobilization under the direction of the chief of the military railway organization and his staff, under whom all railways became immediately subject, as he was empowered to issue all orders for regulating the war traffic, and had at his disposal the railway sections of the great railway staff in Berlin. Germany's railway systems were soon augmented by the railways in the conquered territory, which had to be repaired in case of damage to track, and put in working order and connected with the German lines. The organization of the railway traffic in the conquered district was on a basis similar to the railway administration in Germany. Two military railway administrations were formed for this purpose. One of these had its headquarters at Aachen previous to proceeding to Belgium, and straightway the lines of the conquered district were repaired so rapidly that German rolling stock could be sent even as far as Louvain, filled with troops, and empty trains returned, even under fire. The second military administration was set up on Aug. 20, 1914, at Ulflingen, and gradually pushed forward, while railway commandos were established in Luxemburg, and in the East, at Lodz, to take care of the conquered districts of Russian Poland.

As was natural, the construction operations of the German railway troops consisted during the first months of the war in replacing tracks and restoring damaged railway buildings and other plants, or laying new lines where they were required by the military authorities. The nature of the operations required the construction of small field railways to bring up ammunition and provisions to the particular places where German troops were located, and these lines became increasingly important with the development of French fighting. Many of the bridges which were destroyed, and which had been temporarily repaired, were replaced by permanent structures, various tunnels were restored, and a large number of lines opened to traffic, this requiring in many cases the construction of stations and increased station facilities.

The German official report gave the following statistics for the operation of German military lines in Belgium and France for the month of April, 1915, the figures being approximate:

TRAFFIC IN THE CONQUERED RAILWAY TERRITORIES
(BELGIUM AND FRANCE) FOR THE MONTH OF
APRIL, 1915

(In round figures)

1. Distance in kilometers (kilometer=.621 mile) at the end of the month:			
	Single line	Double line	Total
A. Used by military...	3,000	4,100	7,100
B. Leased	450	150	600
C. Not in use	550	20	570
D. Not restored	90	29	110
E. Under construction.	400	15	415
Total	4,490	4,305	8,795

As a result of the war and the military operation of the railways, the usual train service in Germany was considerably reduced. The timetable itself showed a high percentage of trains withdrawn. The reduced service for the most part, however, carried on by employees over military age was very satisfactory and well organized. In many ticket offices women were employed, and the usual dining and sleeping cars were operated on the more important express trains between large cities. All the German railways were being worked on one single system, which was extended to the whole of Belgium under German occupation, as well as to the occupied portions of France and of Russian Poland. Direct express trains, with sleeping and dining cars, were run from Berlin to Metz-Charleville-Mezières, and also to Brussels and Lille, so that a civilian with proper official papers could travel to the occupied territory to the west to places as far as Noyon, Laon, and Chauny, just as he could travel eastward to Lodz.

The German military authorities, only 11 days after the capture of Warsaw, put on a Lille-Warsaw express train connecting the two extremes of occupied enemy territory, some 800 miles apart. This train left Lille at 6.40 A.M., Brussels at 8.30, Berlin at midnight, and arrived in Warsaw in time for luncheon the next afternoon. Late in the year the German railway administration issued the new time-tables for the Berlin-Munich-Constantinople trains. These were not to go through Belgrade, as the bridge over the Save and the Ripanj tunnel were still unusable, but were to follow the route Berlin-Munich-Budapest-Temesvár-Verschez, crossing the Danube at Semendria, and reaching Nish by a secondary line. Thence they would proceed to the Turkish capital.

The Imperial administration of ports and telegraphs embraces all the German states except Bavaria and Württemberg; these kingdoms operate, under certain limitations, their own postal and telegraph systems. In addition to the state telegraph lines, there are railway telegraph lines and some private lines. The following table relates to the year 1913 (the figures for the empire do not include those for Bavaria and Württemberg): *A* number of post offices; *B* state telegraph offices; *C* railway and private telegraph offices; *D* total telegraph offices; *E* length in kilometers of state telegraph lines; *F* length of state telegraph wire; *G* number of places (towns, etc.) having telephonic communication:

	Empire	Bavaria	Württemberg	Total
A	84,860	5,855	1,200	41,415
B	33,315	6,023	2,347	41,685
C	5,194	3,118	21	8,328

	Empire	Bavaria	Württemberg	Total
D	88,509	9,186	2,868	* 50,018
E	195,451	31,656	11,486	238,493
F	649,822	95,918	19,587	765,327
G	32,897	5,985	2,255	41,087

* Exclusive of 17 radiotelegraph stations and 213 on board ship.

FINANCE. The standard of value is gold. The monetary unit is the mark, whose par value is 23.821 cents. The Imperial revenue (ordinary, extraordinary, and total) for the fiscal years 1912 and 1913 and the estimates for 1914 (including supplementary estimates) and 1915 are reported as follows, in thousands of marks:

	1912	1913	1914	1915
Revenue:				
Ord.	2,827,194	3,194,399	3,405,178	3,823,081
Extr.	88,190	190,292	* 10,392,752	10,042,342
Total.	2,915,384	3,384,691	13,797,930	13,865,423
Expenditure:				
Ord.	2,707,865	3,403,034	3,405,178	3,323,081
Extr.	185,978	117,868	† 10,392,752	† 10,042,342
Total.	2,893,843	3,520,902	13,797,930	13,365,423

* The 1914 estimate was supplemented by war loans amounting to 10,000,000,000 marks, under laws of Aug. 4 and Dec. 8, 1914. † Extraordinary war expenditure was placed at 10,300,000,000 marks in the 1914 and 10,000,000,000 marks in the 1915 budget.

The larger ordinary expenditures in 1912 and 1913 respectively were: military administration, 684,182,900 and 747,047,100 marks; Imperial posts and telegraphs, 675,861,300 and 713,458,800 (revenue from Imperial posts and telegraphs, 792,870,500 and 833,314,600); debt, 225,471,200 and 239,391,300; naval administration, 183,676,900 and 204,426,300; pensions, 143,834,000 and 146,336,900; railway administration, 104,406,200 and 111,938,300 (revenue from railway administration, 155,105,000 and 153,580,200); general administration of finance, 97,031,500 and 107,473,400 (revenue from general administration of finance, which includes customs, stamps, etc., 1,792,751,000 and 2,095,196,200); interior department, 90,750,700 and 96,805,400.

The annual ordinary expenditures of the constituent states amount to a sum far larger than the Imperial expenditures; the latter are exceeded by those of Prussia alone.

The Imperial debt, as reported for Oct. 1, 1913, was 5,177,225,300 marks, of which the interest-bearing debt was 4,897,225,300 marks; the non-interest-bearing debt consisted of treasury bonds 160,000,000 marks and paper money 120,000,000 marks. The interest-bearing debt plus outstanding paper money has stood as follows (March 31st): 1880, 377,526,600 marks; 1890, 1,240,908,800; 1900, 2,418,517,700; 1905, 3,323,500,000; 1910, 5,013,500,000; 1912, 5,014,012,900; 1913, 4,925,796,200.

The interest-bearing debt of Prussia in 1913 was 9,901,769,100 marks; Bavaria, 2,285,976,100; Saxony, 861,109,900; Württemberg, 621,377,000; Baden, 586,355,500; Hesse, 434,632,400; Mecklenburg-Schwerin, 144,574,400; Saxe-Weimar, 2,222,600; Mecklenburg-Strelitz, 2,680,200; Oldenburg, 82,689,800; Brunswick, 43,763,800; Saxe-Meiningen, 7,287,800; Saxe-Altenburg, 882,700; Saxe-Coburg-Gotha, 6,004,600; Anhalt, 5,329,300; Schwarzburg-Sondershausen, 1,672,200; Schwartzburg-Rudolstadt, 4,560,200; Waldeck,

1,531,000; Reuss Elder Line, none; Reuss Younger Line, 1,040,600; Schaumburg-Lippe, 387,100; Lippe, 970,600; Lübeck (city and state), 74,906,300; Bremen (city and state), 299,766,400; Hamburg (city and state), 780,581,000; Alsace-Lorraine, 44,546,600.

ARMY. See **MILITARY PROGRESS**, *passim*.

NAVY. Authentic information is not available in regard to naval construction since the beginning of the war in 1914. The following summary is taken from a statement of the Office of Naval Intelligence at Washington and relates to July 1, 1914. Number and displacements of warships of 1500 or more tons, and of torpedo craft of 50 or more tons, built and building: Dreadnoughts (battleships having a main battery of all big guns, that is, 11 or more inches in calibre): built, 13, of 285,770 tons displacement; building, none. Coast-defense vessels, 2, of 8168 tons; building, none. Battle cruisers (armored cruisers having guns of largest calibre in main battery and capable of taking a place in line of battle with the battleships): built, 4, of 88,749 tons; building, 4, of 112,000 tons. Armored cruisers: built, 9, of 94,245 tons; building, none. Cruisers: built, 41, of 150,747 tons; building, 5, of 26,900 tons. Torpedo-boat destroyers: built, 130, of 67,094 tons; building, 24, of 14,400 tons. Torpedo boats, none built or building. Submarines: built, 27, of 14,140 tons; building, 18, of 14,400 tons. Total tonnage: built, 951,713; building, 354,864. Excluded from the foregoing: ships over 20 years old from date of launch, unless reconstructed and rearmed within five years; torpedo-boat destroyers over 15 years old; vessels not actually begun or ordered, although authorized; transports, colliers, repair ships, torpedo-depot ships, and other auxiliaries. After the outbreak of the war, the battle cruiser *Goeben* (22,640 tons) and the cruiser *Breslau* (4550 tons) were reported as sold to Turkey.

In the summer of 1914, the active personnel of the navy was reported at 79,197, including 2 admirals of the fleet, 6 admirals, 12 vice-admirals, 22 rear-admirals, 154 captains and commanders, 2220 other line officers, 340 medical officers, 276 pay officers, 162 naval constructors, 30 chaplains, 3183 warrant officers, 65,797 enlisted men, 177 marine officers, and 5791 marines. See also **NAVAL PROGRESS**.

GOVERNMENT. The empire is a federal state. Its constitution bears date of May 4, 1871, and was amended March 19, 1888. This instrument vests the executive authority in the King of Prussia as German Emperor; he is authorized to conclude treaties, to declare war (if defensive) and peace, and to appoint and receive diplomatic representatives. In 1915, the Emperor was William II, who was born Jan. 27, 1859, and succeeded his father (the Emperor Frederick III) June 15, 1888. The heir-apparent or Crown Prince is Prince Frederick William, born May 6, 1882.

The legislature consists of the Bundesrat, a federal Council (61 members appointed for each session of the governments of the several states), and the Reichstag (397 members elected for five years by direct manhood suffrage).

The Imperial ministers, or secretaries of state, do not form a ministry proper, but act independently of each other under the general supervision of the Imperial Chancellor. The Chancellor, who is the highest official of the empire

and president of the Bundesrat, is appointed by the Emperor without reference to the political majority in the Reichstag, and to the Emperor he is directly responsible. The Imperial Chancellor (and Prussian Prime Minister) in 1915 was Theobald von Bethmann-Hollweg (from July 14, 1909). Imperial secretaries of state in 1915: foreign affairs, Gottlieb von Jagow (he succeeded Alfred Kiderlin-Waechter, who died Dec. 30, 1912); interior, Klemens Delbrück (from July 14, 1909); marine, Grand Admiral Alfred von Tirpitz (from June 15, 1897); justice, Hermann Lisso (from Nov. 1, 1909); treasury, Karl Helfferich; posts and telegraphs, Reinhold Kraetke (from 1901); colonies, Wilhelm Solf (from Dec. 20, 1911).

HISTORY

THE FOOD SUPPLY. Considering that the ultimate issue of the war must depend in part at least upon the ability of the British navy to "starve Germany out" by cutting off the food supplies which had formerly been imported from abroad, vital importance attaches to the measures which the German government instituted for the conservation of the food supply in Germany. Soon after the outbreak of war maximum prices had been fixed for some commodities, like cereals and potatoes; but still the prices of food continued to rise, and the drastic action of the government was obviously demanded to correct two glaring abuses—the extravagance of consumers and the manipulation of the market by speculators—which manifestly aggravated the misery of the poorest classes and caused widespread discontent. In January, therefore, the government decided to lay its hands upon the food supply, to stop speculation, and to regulate consumption. To this effect ordinances were published in the *Reichsanzeiger* of January 25th, providing that all supplies of wheat or rye, pure or mixed, threshed or not, were to be confiscated and taken over from private individuals by the War Grain Association; at the same time all supplies of flour were to be taken charge of by the Communal Association in each town. In compensation, private owners would be paid the average price which prevailed between Jan. 1-15, 1915, except in cases where a maximum price had been fixed by the government. Dealers and trade mills would be permitted to handle half the amount of flour per month that they had sold from January 1-15. Bakers and confectioners were limited to three-fourths the amount they had been accustomed to use. The consumption of cereals was to be regulated under the general supervision of an Imperial Distributing Bureau, composed of 16 delegates to the Bundesrat, in addition to one representative of the German Agricultural Council, one representative of the German Commercial Congress, and one representative of the German Municipal Congress. While the Distributing Bureau in coöperation with the War Grain Association controlled the general distribution of the grain and flour supply, local consumption was to be regulated by Communal Associations, which would have the power to distribute flour to bakers, confectioners, and retailers, to determine the composition of bread, to prohibit the baking of cakes, to regulate the delivery of bread and flour by dealers, subject to the general principles of, and limited by the maxima

established by, the Distributing Bureau. The ordinance also contained a clause that foreign grain, if imported, could be sold only to the War Grain Association or to the Central Purchasing Association, or to the Communal Associations; but this provision was rescinded on February 6th. On the same day that the confiscation of grain and flour was decreed, January 25th, an order was issued obliging towns of over 5000 inhabitants to acquire and maintain a supply of preserved meat adequate to suffice for the needs of the population in case of emergency. In February, a further step was taken for the regulation of the bread supply. Each individual was given a "bread card" with coupons calling for 25, 50, and 100 grams of bread, enough amply to supply his or her needs for the week, but not to permit the purchase of a large supply for future use. The cards were to be presented and the appropriate number of coupons clipped, before bread could be purchased at restaurants, bakeries, or grocery stores. In this manner, by enforcing the strictest economy, the German government hoped to minimize the hardship occasioned by the shortage of food until the next harvest. It was anticipated that as time progressed, in case of a long-drawn-out war, the situation would become more instead of less favorable. Potatoes could be much more extensively cultivated and used to feed live stock as well as to supply the table. Grain hitherto used for the manufacture of starch or of alcohol could be saved for food. A yeast-process was invented that would help supply albuminous fodder. Instead of producing a surplus of rye and of beet sugar, Germany could raise more wheat and more beans and peas. Moreover, there were at least 33,000,000 acres of moorland which could be converted into valuable grainfields if men could be found to perform the labor and if sufficient quantities of fertilizer could be applied; and what with the invention of new fertilizers and the increasing number of prisoners of war (at the beginning of January there were 586,000 prisoners of war in Germany; in March, 810,000; at the end of July, 1,900,000), it began to appear that neither the fertilizers nor the labor would be lacking. See also **FOOD AND NUTRITION**.

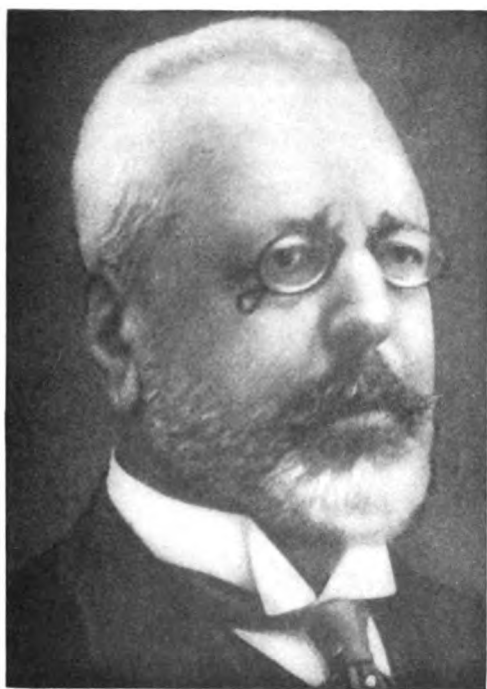
EFFECT OF THE FOOD REGULATIONS. By the beginning of June, the effect of the regulation of the bread-supply had become apparent. On June 5th the Prussian minister of the interior announced that the bread problem was practically solved. There would even be a surplus of grain to carry over into the next harvest year, so that no anxiety need be felt if the coming harvest should not be extraordinarily plentiful. Moreover, and this was a most important result of Germany's military successes, grain and potatoes had been planted in large quantities in conquered territory, so as to relieve the pressure upon German agriculture. In August it was calculated that, thanks to the bread cards, and thanks to the increased supply of grain from conquered territory, the next year it would be possible to allow a very generous increase in the individual consumption of wheat and rye flour. Meantime, as the bread question became less pressing, the shortage of meat began to cause the gravest anxiety. In Berlin, May 29th, hotels were ordered to abolish *table-d'hôte* dinners, to encourage the use of more vegetables and less meat, to substitute boiled meat for roast meat



THEOBALD VON BETHMANN HOLLWEG
Chancellor of German Empire



Admiral ALFRED VON TIRPITZ
Secretary of the Navy, Germany



Photograph by Paul Thompson

Baron STEPHAN BURIAN VON RAJE CZ
Premier and Minister of Foreign Affairs
Austria-Hungary



Photograph by Paul Thompson

GOTTLIEB VON JAGOW
Secretary of State for
Foreign Affairs, Germany

GERMAN AND AUSTRIAN MINISTERS, 1915

where possible, and to use fat and lard sparingly. To relieve the shortage of meat would not be so easy as to solve the bread question. The creation of an Imperial Fodder Board, to supply cattle, swine, and fowl raisers with oat, barley, and molasses substitutes for oat fodder, and the appointment of a certain number of days in the week when meat should not be eaten, were helpful measures but not complete solutions of the problem.

THE REICHSTAG IN MARCH. After eight months of the war, the Reichstag met again on March 10th for its third war session. The fear that Germany stood in immediate danger of being crushed by an iron ring of foes had by this time proved groundless; in its stead new problems had arisen, regarding the financial burden of a long and exhausting war, anticipating the political consequences of the war, and most of all respecting the economic crisis in Germany. In opening the session, the president of the Reichstag, Dr. Kaempf, declared: "Never can it be too frequently repeated that a people which is capable of such sacrifices, such devotion to the Fatherland, can not be conquered or destroyed. As the Almighty Lord of Hosts has thus far blessed our banners with victory, so also, we are sure, the final victory will be adjudged to our righteous cause. And on the bloody battlefields in the east and in the west, a lasting peace will be achieved, which will bring new blossoming, new might, and a new greatness to our beloved Fatherland." This was the key-note of the session. The first business on the programme was the budget. The Imperial secretary of the treasury, Dr. Helfferich, delivered his maiden speech as a government representative in the tribune of the Reichstag, clearly revealing in his lucid explanation of the financial situation the expertness he had acquired as director of the Deutsche Bank. A further war credit of 10,000,000,000 marks, to be raised by loan, was demanded and received the Reichstag's consent. Interest on the war debt, Dr. Helfferich insisted, should be met from current revenues; as for the rest, he cherished the hope "of being able to present the bill for our war expenditures to our enemies at the conclusion of peace." German financial conditions, the secretary asserted, were on a sounder basis than those of France or England. In spite of the loss of her external trade, worth over 20,000,000,000 marks a year, Germany was still able to endure. "As long as our own soil remains to us, no hunger and throttling policy will succeed in cutting off our necessities of life," he believed. Germany was determined to persevere, and at the end to demand "a reward of victory that is worthy of this huge sacrifice." Following Dr. Helfferich, Deputy Herr Haase, a Social Democrat, mounted the tribune to offer some trenchant criticism of the government. The right of free speech and the liberty of the press, said Herr Haase, had been arbitrarily and unjustifiably interfered with. Moreover, the government had been too reluctant to adopt the measures of government control which the Socialists had been indefatigably suggesting to give the people an adequate supply of food at a fair price. Food speculators should have been relentlessly prosecuted. War profits should be taxed. In conclusion the Socialist deputy delivered an eloquent plea for peace. "In all lands the horrors of war strengthen the desire to put

an end to the frightful butchery of nations. To express this desire is no sign of weakness and can least of all be so interpreted in our own case, for our military successes are incontestable, our economic life has developed in an amazing manner, and our finances have remained firm. It is the strongest who may first desire peace. My party as the representative of international Socialism has always been the party of peace, and it knows that the Socialists of other countries have the same idea. Our desire is for a lasting peace that will not contain within itself the germs of new entanglements and new dissension. It must be established that no nation may oppress another, and above all that all nations shall perceive their peaceful mission in the exchange of cultural goods." Against this peace manifesto an immediate protest was raised by Dr. Spahn in the name of all the other parties excepting the Poles, on the ground that it would "lead to misunderstandings abroad." "We are waging war," he continued, "not for the sake of war but for the sake of peace; but it must be a peace that more than hitherto will ensure the prosperous development of German labor and the German spirit of enterprise, and give the Fatherland a permanent guaranty and protection for its greatness. The achievement of this goal demands still more victorious battles." The Social Democrats continued to perturb the otherwise unruffled confidence of the Reichstag. Herr Schmidt, a Socialist from Berlin, called attention to the sufferings of the very poor. Millions of families, he said, had nothing to rely upon but their war allowance of 12 marks per month with 6 marks additional for every child. "How shall these families subsist," he asked, "when the loaf of bread that formerly cost 50 pfennigs in Berlin now costs 95, and the potatoes which used to sell for 3-3½ pfennigs a pound now have risen to 7-10 pfennigs? In the Rhine country the cost of living has increased even more." Another Socialist, Herr Ledebour, occasioned an uproar in the Reichstag by making a plea in behalf of the Poles, Danes, and Alsations and by denouncing the threat which the German military authorities had made, that for every German village in East Prussia destroyed by the Russians, three Russian villages in Poland would be destroyed by the Germans. Amidst vehement interruptions, the presiding officer of the Reichstag reminded the speaker that "criticism of the military authorities under the present circumstances during the war cannot be allowed." Dr. Karl Liebknecht (Socialist) was reprimanded for exclaiming "barbarism!" when Ledebour referred to the German threat regarding the burning of Polish villages. Representatives of the non-Socialist parties protested formally against the insult which had been uttered against the German General Staff. Even the Socialist group, or a majority of the group, speaking through its chairman, Herr Scheidemann, was constrained to disavow Herr Ledebour's remarks, and after a brief recess, Herr Scheidemann announced that, for the same reasons which had actuated them on Aug. 4 and Dec. 2, 1914, the Social Democrats this time would again vote for the budget. The final vote on the budget was therefore unanimous, with the exception of two rebellious Socialists, Liebknecht and Ruehle.

MAY SESSION OF THE REICHSTAG. The brief session of the Reichstag in May, concerned chiefly with the economic measures necessary to carry

on the war, gave new proof of the solidarity of the various parties. Only a few Socialists continued to oppose the war. The comment of the *Frankfurter Zeitung* is worth noting: "The great majority of the Social Democrats think and feel about this war just as does the rest of the German nation. That they have a passionate wish that a good peace should speedily follow the war, in no way differentiates them from the rest of the Germans. For all Germans would have preferred peace, and would rather see a speedy than a distant peace; but all know, also, that the possibility of peace does not depend on us alone, and that only such a peace is possible for Germany as will insure us against the danger of new wars for all time." As far as the demand of the Socialists for democratic reforms was concerned, the *Frankfurter Zeitung* observed that it would be impossible for everything to "slip back again into the old ways" after the war; that the German nation must be organized democratically if the splendid spirit of solidarity and fraternity that had manifested itself during the war was to be preserved, so that Germany could become a leader and a model for all nations.

THE CHANCELLOR'S SPEECH. The close of the May session was signalized by a great speech of Chancellor von Bethmann-Hollweg, May 28th. The German Chancellor in vehement terms denounced the infidelity of Italy (Italy had just declared war against Austria-Hungary; see article **WAR OF THE NATIONS, Italy's Entry into the War**). Without shedding a single drop of blood, Italy could have obtained, according to Von Bethmann-Hollweg, land in the Tyrol and on the Isonzo, "as far as the Italian language is spoken," "satisfaction of her national desires in Trieste," "a free hand in Albania," and the Albanian harbor of Valona. "Germany pledged her word that the concessions would be carried out. There was no ground for distrust." This reference to Germany's word of honor, after the events of August, 1914, called forth no little sarcastic comment from the Entente press. In defining Germany's position, the Chancellor hinted that the greater the odds that Germany had to fight, and the harder the combat, the greater would be the German determination to persevere "until we have won all possible real guarantees and assurances that none of our enemies, singly or in coalition, shall again hazard an armed conflict with us."

A YEAR OF THE WAR. On July 31st, after just one year of the war, the Emperor issued a proclamation "to the German people," reaffirming Germany's innocence in the striking words, "Before God and history my conscience is clear. I did not want the war." With pious gratification the Emperor declared "with grateful hearts we may say to-day: God was with us." As for the terms of peace, he referred to "military, political, and economic guarantees for the future" and "conditions for the unrestricted expansion of our creative energies at home and on the free seas." The newspapers, in summing up the results of the first year of the war, pointed out that Germany had won almost 2,000,000 prisoners (Russians, 1,518,000; French, 268,000; Serbians, 50,000; Belgians, 40,000; English, 24,000). To balance the loss of her colonies, she had conquered extensive territories in Europe, including 68 per cent of the coal resources of France, 90 per cent of her

iron ore, 68.7 per cent of her textile industry, and 43 per cent of her total industry. The supply of metals, cotton, and other raw materials in Germany had been seriously curtailed, so that it had been necessary to commandeer, February 1st, all supplies of copper, tin, aluminum, nickel, antimony, and lead for military purposes, thus crippling certain industries; nevertheless German industry was giving evidence of remarkable vitality. The great fair at Leipzig in the spring had furnished a magnificent display of German industries. The industrial region of Westphalia was described as a vast workshop, busy night and day, supplying the material equipment of war. Finally, the German press was not slow to boast that although German commerce had been temporarily driven from the seas, Germany's enemies had suffered more than three times as heavily, both in merchant- and in war-ships, comparing the tonnage of ships actually lost.

THE REICHSTAG IN AUGUST. The fifth war session of the Reichstag was convened on August 19th. The Imperial Chancellor, in a long review of the causes of the war, laid the guilt at the door of the Triple Entente, and blamed France for lending money to Russia for military preparations against Germany. England, he said, had suffered a severe blow to her self-confidence and her hypocrisy. "The myth that it was only on Belgium's account that she was waging war, England herself has abandoned." The claim of England to be the protector of the freedom of small nations was being disproved by her interference with the freedom of the seas, by her seizure of Greek islands in the Ægean, and by her attempts to involve Greece and Rumania in the war. "In Poland, where Russia is fighting with her allies for the freedom of nations, the entire country has been devastated by the retreating Russian armies. Villages were burned down, grainfields trampled under foot, and the population of entire communities, Jewish and Christian, sent into exile." "That is the way the Freedom and Civilization appear, for which our enemies fight." "We will continue this war," said Von Bethmann-Hollweg, "until the way will be clear for a new Europe, free from French conspiracies, from Muscovite lust for conquest, and from English tutelage." The Chancellor also made an important declaration respecting the future of Poland, that the Poles were to be "emancipated from the Russian yoke" and "given an opportunity to develop their national character." The declaration was so worded, however, that while it explicitly stated that the Poles were to be free from Russia, it left very vague the relationship which would exist between Poland and Germany. The day after Von Bethmann-Hollweg's speech, the secretary of the treasury came forward with a demand for another war credit of 10,000,000,000 marks. The credits previously voted had brought the total up to 20,000,000,000 marks, a sum equal to the value of the entire German railway system, including equipment and rolling stock. More was being spent in a single month than had been expended in the entire Franco-Prussian War. Germany's war cost was now approximately 70,000,000 marks a day, whereas England was called upon to supply 80,000,000 marks a day. Germany's superiority in financial strength was still asserting itself, he claimed. Following Dr. Helfferich's speech the various

parties in the Reichstag made brief declarations of policy. Dr. David, for the Social Democrats, hoped that war profits would be taxed, and that peace would come soon enough to render further war loans unnecessary. The food problem, he complained, had not yet received "a satisfactory solution." Concluding his remarks, the Socialist leader made a significant demand for democratic reform: "The might that gave us our interior strength cannot be employed by us except in the interest of freedom. Thus spoke the Imperial Chancellor. He was thinking about external policy. We, however, expect that internal freedom will not be denied us. Equal rights may not be denied to the great mass of the people. In this spirit we vote for the war credit." Herr Bassermann, in behalf of the National Liberals, heartily supported the government, and declared that the German Emperor was a Peace Emperor, until the war was forced on Germany and he was compelled to take the sword in self-defense. Herr Fischbeck, who spoke for the Progressive People's Party, approved the loan, but admitted ruefully that "our economic life has its gloomy side." The Conservative spokesman, Dr. Oertel, approved the loan and advocated vigorous measures against food speculation, generous support of the families of soldiers and crippled soldiers, and repeated the phrase that was coming to be stereotyped, "The magnitude of the reward of victory must correspond to the magnitude of the struggle." Dr. Spahn, for the Centre, signified approval of the loan. The Polish leader, Herr Seyda, referred with satisfaction to Bethmann-Hollweg's promise of freedom for the Polish people, and expressed the hope that the war would allow the "free development of the national life of the Polish people." Dr. Schultz, of the Empire Party, reiterated the Conservatives' declaration, that "our army and our entire nation desires a peace which will be worth the sacrifice, and we are confident that our statesmen will obtain for us the kind of a peace which the nation desires." The declarations of the parties in the Reichstag are cited, because they indicate the progress of the movement in favor of territorial conquests. It may be added, that the confidence of the wealthy and middle classes in the ultimate success of German arms received new and eloquent confirmation in the rapidity with which the third war loan was subscribed. The loan was offered to the public September 2nd. Within three weeks enough subscriptions had poured in to cover the loan, 10,000,000,000 marks, with 2,000,000 marks to spare. Nearly 45,000 depositors of the Berlin Savings Bank subscribed to the new loan, compared with 35,000 for the March loan. (For a discussion of the attitude of the Socialists in the Reichstag, see SOCIALISM.)

THE DEBATE ON PEACE TERMS. The discussion of the terms which Germany should demand at the conclusion of the war reached a climax in the historic Reichstag debate of December. The debate was opened by Dr. Scheidemann, spokesman of the Social Democrats, who interpellated the government on the subject of possible peace terms. Inasmuch as Germany had demonstrated her amazing strength and determination, as she unquestionably has done, she could now afford to make the first move in the direction of peace, certain that her desire for peace would not appear as weakness. In

reply to the Socialist interpellation, the Imperial Chancellor delivered a long speech, dwelling at length upon what he conceived to be the unutterable folly and hypocrisy of the Entente Powers. Pretending to fight for "the destruction of Prussian militarism" and for the freedom of small nations, the Entente Powers were really striving, and striving in vain, to dismember Germany and to advance their own selfish interests. But Germany was invincible. As for the terms upon which Germany would consent to make peace, he refused to go into detail. The Entente Powers, having been the ones to begin the war, must be the ones to ask for peace. As soon as they were ready to admit defeat, however, and to approach Germany with peace proposals "which are in consonance with Germany's dignity and security, we will always be ready to discuss them." While making this declaration as proof of Germany's love of peace, he warned the Quadruple Entente that "the longer and more bitterly they wage the war, the greater will be the necessary guarantees" which Germany would demand to prevent future attacks. Some intimation of what Germany would in any case demand was given by the following passage of Dr. von Bethmann-Hollweg's speech: "Neither in the west nor in the east must our enemies of to-day hold in their possession the entrance gates to our country through which they might attack or menace us anew. It is known that France gave loans to Russia only on condition that Russia strengthen her railways and fortresses in Poland against us; also that England and France regarded Belgium as their route of advance against us. Against this danger we must have military and political security. Also we must insure our economic development. . . . As regards the means to this end, we must reserve complete freedom of decision." From these vague sentences it might be inferred that Germany would take Poland from Russia, and Verdun and Belfort from France; Belgium might be annexed outright or placed under a sort of military and economic German protectorate; and Germany's economic future might be secured by annexing extensive colonies, or by restoring Egypt to Turkey and making the Turkish Empire a German sphere of economic exploitation, or by gaining control of Belgian seaports and mines, or by exacting huge indemnities from the vanquished Powers, or by forcing them to lower their tariff walls against German manufactures. In reference to the condition of the territories which had been occupied by German armies, the Chancellor had the most favorable reports to make. Belgium, he announced, was recovering from her injuries; Belgian commerce and industry were reviving, coal was being mined in considerable quantity, and instruction in the Flemish language had been made obligatory for all. As regards the conquered Russian territory, Dr. von Bethmann-Hollweg asserted that the German invaders found "terrible devastation" in Poland, Lithuania, and Courland. The Germans, however, had established new police forces, municipal administration, and legal and sanitary organization in the districts occupied by them. They had promoted economic activity, rebuilt railways, constructed roads, introduced "municipal statutes which give the people an interest in participating in public life." "The question of school teaching has everywhere been taken up,"

he said, and a university and a technical institute had been opened at Warsaw. "Never in history, when millions of men were opposed in a fight for life and death, has so much peaceful work been accomplished behind the front." At the conclusion of Dr. von Bethmann-Hollweg's address, the non-Socialist parties of the Reichstag united in declaring their satisfaction and in proclaiming that "in complete unity, with calm determination, and with confidence in God, we await the hour which will make possible peace negotiations whereby the military, economic, financial, and political interests of Germany will be permanently assured, to the most complete extent, and by all measures, including such annexations of territory as may be necessary for this purpose." The annexationist spirit, which had gradually increased in intensity and in popularity during the year, in December was seen to dominate the Reichstag. The only dissenting voice came from the Socialist benches, where a small but determined minority opposed "all schemes of conquest," and where the majority, while willing to vote war credits, and unwilling to permit France to regain Alsace-Lorraine, might be counted upon to offer some remonstrance against the annexation of Belgium and Northern France. (For a discussion of the Socialists' attitude, consult SOCIALISM.)

THE FINANCIAL BURDEN. During the December session of the Reichstag, Dr. Helfferich again demanded a new war credit of 10,000,000,000 marks, and obtained the authorization of the Reichstag for the issue of a new loan to cover the amount. Dr. Helfferich characterized the German plan of financing the war as a policy "based on sober and cool consideration of all the facts, and particularly on the demand that the productive energy of the German nation shall be maintained as efficiently as possible during the war." He warned the Reichstag, however, that a time was coming when German capital would be invited not to invest in 5 per cent loans, but to pay heavy war taxes. Regardless of the amount of the war indemnity, the war would bring in its train a "colossal" tax burden, which the German people would have to bear by increased taxation. One feature of the new taxes, foreshadowed by the secretary of the treasury, would be the taxation of war profits; and companies doing a war business would be required to lay aside 50 per cent of their war profits in preparation for the tax that would follow the conclusion of peace. The statements of Dr. Helfferich did not wholly satisfy the Socialists. In the Reichstag, and in their party organ, *Vorwaerts* (which, by the way, had been suppressed more than once for its criticism of the government), the Social Democrats pointed out the gravity of the financial situation. Where, they asked, was Germany going to obtain the revenue sufficient to meet the annual interest, amounting to two billion marks, on the war debt of forty billions? Certainly the ordinary revenues and the income from customs duties would be insufficient. The inference was of course that taxes on large incomes and fortunes should be introduced to fill the gap.

THE POLES AND DANES IN PRUSSIA. The budget debates in the Prussian Diet gave rise on March 9th to a most interesting expression of the attitude of the Poles and the Danes in Prussia. In behalf of the Poles, Dr. von

Tramczynski declared, "For more than 30 years the government and the majority of the Landtag have regarded the Polish population as an enemy within the state, and have sought to cripple the free development of our national individuality by means of exceptional laws and administrative measures. More than 12,000,000 marks, towards which we have been forced to contribute in taxes, have been expended by the state for the suppression of our nationality. To fight against these efforts was our duty and our right. But although now as hitherto we are decided to defend our nationality to the last breath, we have never abandoned legal methods, and have always fulfilled our duties as citizens. We have voted all the war credits here and in the Reichstag. On the battle fields more Polish blood has been shed for the state than the size of the Polish population would give reason to expect." In return the Poles had expected no longer to be treated as enemies. "In particular we had expected that the government would at least concede the suspension of the Expropriation Law and the Settlement Prohibition, as well as the reintroduction of Polish popular education. Nothing of the sort happened. The government has contented itself with holding out vague suggestions of a future alteration of conditions. . . . Even this year's budget contains all the appropriations destined for the oppression of the Polish nationality. We protest against this treatment." On these grounds the Poles voted against the Prussian budget. Next, Deputy Njssen, a Dane, reminded the House that the Danes had always fulfilled the duties of citizenship, although they had been unjustly accused of many disloyal acts. In this war, "they have bled by thousands on the battlefields in the east and in the west. But even during the war, the exceptional treatment of the Danish population is continued, in absolute contradiction to the Emperor's declaration that there were no longer any parties in the land. The budget contains many items for combating the Danes in North Schleswig, and therefore it is impossible for us to vote the budget." The Social Democrats joined with the Danes and Poles in opposing the budget, and demanded that democratic franchise and the right of free combination be granted to the masses. In the final vote on the budget, the Socialists alone voted *contra*, while the Danes and Poles abstained.

THE SOCIALISTS IN THE PRUSSIAN DIET. A disquieting feature of the Prussian Landtag session in June was the anti-war attitude taken by the Socialists. The House of Deputies was thrown into an uproar when Herr Braun, the Socialist floor leader, proclaimed his belief that "it would be a calamity for Germany" to carry the ideas of annexation and conquest which had been gaining ground, under the encouragement of selfish interests and short-sighted political parties. "The German nation wants no conquests and no annexations," he asserted, "it wants peace, and a peace which neither humiliates nor violates other nations." At the same session Herr Liebknecht cried out: "We have the masses with us and the masses want peace." High prices, the selfishness of Prussian landlords, and the criminal greed of food speculators receive their due share of denunciation from the Prussian Socialists.

THE ECONOMIC SITUATION IN PRUSSIA. Be-

fore terminating its session in June the Prussian Diet found time to discuss the grave economic problems which the war had created. Reports were made on various phases of the economic situation, and in accordance with the recommendations of the special committee which had investigated the matter, a series of measures were approved for the more efficient conservation of the kingdom's resources. The War Grain Company, which had hitherto controlled the purchase of food supplies, was now to be dissolved and a central committee instituted, representing consumers and producers; the committee would assume control of the purchase of provisions, acting in close harmony with and in subordination to the Imperial government. In harvesting the next year's crop, it was anticipated that the labor of prisoners of war would be of valuable assistance. As regards the industrial situation, Herr Hirsch of Essen reported that since the outbreak of war the production of crude iron had increased by about 1,000,000 tons a month and the output of manufactured steel and iron had been doubled. This increase had been largely absorbed by the enormous demands of the munitions factories. In regard to Germany's economic future, Herr Hirsch displayed the cheeriest optimism. Germany had withstood the shock of the interruption of her raw material supplies, and she would emerge from the war stronger and more prosperous than ever before.

BAVARIA. King Ludwig of Bavaria made a very important speech June 7th before the meeting of a Canal Association at Fuerth. The passage in which the King advocated the annexation of new territory at the conclusion of the war was widely quoted by the annexationist party in Germany. "When the war began," said King Ludwig, "we assured ourselves that it would be a war of short duration. But events shaped themselves differently. Upon the war declaration by Russia followed the declaration of war by France, and when in addition the English fell upon us, I said I rejoice thereat, and I rejoice for this reason, that now we can hope—and this especially concerns the Canal Association—that ultimately we may assure for South and West Germany more favorable connections with the sea. Ten months have elapsed since then. Much precious blood has been shed. But it shall not have been shed in vain. A strengthening of the German Empire and the extension of its frontiers as far as is necessary to insure us against future wars, that shall be the fruit of this war."

OTHER EVENTS. A university was chartered August 1st, at Frankfort on the Main. The university included faculties of medicine, philosophy, natural science, and social science, and numbered on its teaching staff 49 professors, 13 assistant professors, and 18 docents. In December it was estimated that during the first eight months of the year, 186 counts, 456 barons, 592 members of the old nobility, and 552 members of the newer nobility had been killed in the war. Nine princes had been slain in the war, including Maximilian of Hesse, Friedrich Wilhelm zur Lippe, Friedrich of Saxe-Meiningen, Ernst of Saxe-Meiningen, Ernst zur Lippe, Otto Victor of Schönburg-Waldenburg, Wilhelm zu Schönau-Carolath, Wolrad zu Waldeck und Pyrmont, and Henry XLVI of Reuss.

CHANGES IN WAR STAFF. General von Fal-

kenhayn resigned his post as minister of war January 21st, but continued as chief of staff. As war minister he was succeeded by Major-General von Hohenborn. In February, Admiral von Pohl, chief of the Admiralty Staff, succeeded Admiral von Ingenohl in command of the German battle fleet. Consult also **UNITED STATES, Foreign Relations; MILITARY PROGRESS; WAR OF THE NATIONS; SOCIALISM.**

GERBITZ'S CHART, LOST ISLANDS OF. See **EXPLORATION, North America.**

GERVILLE-REACHE, JEANNE (Mrs. GEORGE G. RAMBAUD). A French opera singer, died Jan. 5, 1915. She was born in 1882, in the Basque province, and she studied music in Paris. In 1899 she came to the notice of Mme. Emma Calvé who advised her to study for the operatic stage. At 18 she became a pupil of Mme. Pauline Viardot-Garcia. Not long after she appeared at the Opéra Comique, where she sang in the opera *Orpheus and Eurydice*. She sang with great success in various operas in Paris until 1907, when she was engaged by Oscar Hammerstein to sing at the Manhattan Opera House, and there she continued until 1910. During this period she created the part of Clytemnestra in Strauss's *Electra*. While at the Manhattan Opera House she also sang in *Carmen*, *Pelleas and Melisande*, *La Navarraise*, and *Samson and Delilah*. She later joined the Dippel Opera Company, singing in Chicago, Philadelphia, and at the Manhattan Opera House. She also made a concert tour through the United States in 1909. She married Dr. George Gibier Rambaud, director of the Pasteur Institute in New York City.

GIBRALTAR. A narrow peninsula extending southward from the southwest coast of Spain; a British crown colony, naval and coaling station, and entrepôt of the British trade with the Barbary States. Area, $1\frac{1}{2}$ square miles; population, exclusive of the military, 18,448 in 1912. Practically a free port, it has no trade returns. Revenue (1913), £104,634; expenditure, £82,077; total tonnage entered and cleared, 12,476,079 (7,416,875 British). The customs revenue in 1913 was £46,624. The Rock of Gibraltar (*Mons Calpe*) was captured by the British in 1704 from the Spanish kingdom of Granada, and in 1713 was formally ceded by the terms of the treaty of Utrecht.

GIFTS AND BEQUESTS. The gifts and bequests made for various purposes in 1915 show a falling off in amount as compared with 1914. This decrease was to be expected on account of the immense sums which were contributed to various foreign relief funds. Adding such contributions, it is probable that more actual money was given away in 1915 than ever before. The total amount thus given could not have been less than \$300,000,000. Outside of money given for war relief and kindred purposes the total for 1915 amounted to \$146,682,930, compared with \$318,599,482 in 1914, and \$199,841,442 in 1913. These sums take into account only donations of a public character. If there should be added all those privately given, the total would have been more. These sums are identified as follows: To charities of various kinds \$79,861,329; to educational institutions \$35,354,338; to religious organizations \$17,611,862; to art museums, galleries, and various municipal institutions \$12,939,401; and to libraries \$916,000. From the women of the

country there was contributed to the total sum \$28,304,658. The three largest contributors did not give as freely in 1915 as in 1914. John D. Rockefeller gave in 1915 \$1,970,000, Andrew Carnegie \$3,330,000, and Mrs. Russell Sage \$341,000.

This list mentions only those gifts whose value was \$5000 or over. We are indebted for it to the courtesy of the *Chicago Tribune*.

Adams, John Q., Long Beach, Cal., will to church, \$5000.
 Agassiz, George R., gift to Harvard University, \$25,000.
 Alexandria, Pa., will to library by William H. Woolverton, \$40,000.
 Allegheny College, gift by Andrew Carnegie, \$40,000.
 Allen, Dudley P., Cleveland, Ohio, will to Cleveland Art Museum, \$100,000; will to Cleveland Medical Library, \$200,000.
 Allen, James H., St. Louis, Mo., will to charity, \$1,000,000.
 Allentown, Pa., Woman's College, gift by various donors, \$75,000.
 Allston, I. W., Philadelphia, Pa., gift to church, \$5000.
 American Baptist Foreign Mission Society, gift by Rockefeller Foundation, \$50,000.
 American College for Girls at Constantinople, gift by Grace Dodge, \$25,000.
 American College of Surgeons, Boston, Mass., gift by various donors, \$500,000.
 American Commission to Belgian Relief, \$1,000,000.
 American hospital, Paris, gift by William Lindsay, \$10,000; gift by Frank A. Munsey, \$50,000; gift by various donors, \$10,000; gift by various donors, New York, \$10,000.
 American Red Cross, gift by Rockefeller Foundation, \$25,000.
 American Relief Clearing House, Paris, gift by James Stillman, \$100,000.
 Ames, Ward, and J. H. Barnes, Duluth, Minn., gift to Y. M. C. A., \$60,000.
 Anderson, Elizabeth, New York, gift to Mental Hygiene Institute, \$50,000.
 Andrews, Mrs. J. M., Raleigh, N. C., will to church, \$18,000.
 Animal diseases, for laboratory for study of, gift by Rockefeller Foundation, \$1,000,000.
 Animal protection, gift for, by Mrs. Russell Sage, \$15,000.
 Annual donations to Episcopal board of missions, \$1,067,000.
 Anti-tuberculosis Association, gift by Elizabeth C. Coolidge, \$100,000.
 Armenian relief fund, gift by Rockefeller Foundation, \$30,000; gift by Mrs. Russell Sage, \$5000.
 Armour, Ogden, Chicago, Ill., gift to Lying-In Hospital, \$100,000.
 Art Institute, Chicago, Ill., gift by Daniel C. French, \$11,000; will by Martha S. Hill, \$30,000; will by Alexander A. McKay, \$100,000; gift by W. H. Miner, \$50,000; will by Albert A. Sprague, \$50,000.
 Atkinson, C. F., Boston, Mass., will to charity, \$31,000.
 Aviation corps, gift by unnamed donor, \$5000.
 Babcock, Eugenie L., Plainfield, N. J., will to church, \$75,000.
 Babcock and Wilcox Co., New York, gift to Stevens Institute of Technology, \$25,000.
 Bachman, Julia A., Columbia, S. C., will to church, \$9000.
 Baden, J. P., Winfield, Kan., gift to Winfield Lutheran College, \$75,000.
 Baker, George F., New York, gift to Cornell University, \$540,000.
 Bale Brothers, Muncie, Ind., gift to Hillsdale College, \$30,000.
 Ballard, H. W., Indianapolis, Ind., will to New Salem Academy, \$10,000.
 Baptist missionary societies, gift by John D. Rockefeller, \$100,000.
 Bard, Thomas B., Ventura, Cal., will to charity, \$15,000.
 Barnard, George D., St. Louis, Mo., will to Barnard Hospital, \$2,000,000; to other charities, \$20,000.
 Barnard College, gift by Jacob H. Schiff, \$500,000; will by Anne E. Smith, \$10,000.
 Barnard Hospital, St. Louis, Mo., will by George D. Barnard, \$2,000,000.
 Barnes, J. H., and Ward Ames, Duluth, Minn., gift to Y. M. C. A., \$60,000.
 Barre (Vt.), hospital, gift by Ira C. Calef, \$20,000; by various donors, \$60,000.
 Barton, Michael, Chicago, will to church, \$25,000.

Battell, Joseph, will to charity, \$10,000; to Middlebury College, \$220,000.
 Batterson, Sarah E. F., Philadelphia, Pa., will to charity, \$100,000.
 Baumgarten, Bernard, Chicago, Ill., will to charity, \$95,000.
 Beall, Amelia G., Carlisle, Pa., will to charity, \$30,000.
 Beall, James M., Baltimore, Md., will to Johns Hopkins University, \$37,500.
 Bedford, Iowa, gift of library by Andrew Carnegie, \$10,000.
 Beebe, J. A., Boston, Mass., will to charity, \$30,000; to church, \$25,000.
 Belgian hospital, gift by various donors, Chicago, Ill., \$20,000.
 Belgian professors, gift by Harvard University corporation, \$100,000.
 Belgian relief, gift by American Commission, \$1,000,000.
 Belgian relief cargoes, \$9,300,000.
 Belgian relief fund, contributions by Detroit, \$38,000; gift by various donors, \$380,000.
 Belgian relief fund vessels, \$4,305,000.
 Belgium, gift by *Chicago Tribune's* moving picture receipts, \$30,000; gift by Kansas, \$500,000.
 Bellows Falls, Vt., gift to charity by various donors, \$450,000.
 Benedict, Maria N., New York, will to charity, \$10,000.
 Benson, S., Portland, Oreg., gift for trade school, \$100,000.
 Berry, H. W., Boston, Mass., will to Northfield schools, \$8000.
 Billok, A. C., Los Angeles, Cal., will to charity, \$30,000.
 Bishop, Charles R., Berkeley, Cal., will to charity, \$19,400.
 Bismarck Garden Festival, Chicago, Ill., to charity, \$80,000.
 Blair, Mrs. J. C., Huntingdon, Pa., gift to hospital, \$30,000.
 Blind, gifts to, by various donors, \$213,000.
 Bliss, Catherine A., New York, will to church, \$20,000.
 Bliss, Mrs. W. H., New York, gift to National Aero fund, \$10,000.
 Block, Joseph, Chicago, Ill., will to charity, \$21,000.
 Blumenthal, Ferdinand, New York, will to charity, \$10,000.
 Board of education, Chicago, Ill., gift by John W. Eckhart, \$10,000.
 Boehne, John M., Evansville, Ind., gift to charity, \$12,500.
 Bondy, Emile C., New York, will to charity, \$150,000; to Columbia University, \$100,000.
 Borie, Josephine L., Chicago, Ill., will to charity, \$25,000.
 Boston, Mass., gift to charity by unnamed donor, \$8000.
 Boston University, gift by various donors, \$10,000.
 Bowdoin, Julia J. G., New York, will to charity, \$20,000; to church, \$30,000.
 Brackenrip, J. W., San Antonio, Texas, gift to University of Texas, \$100,000.
 Bradford, Me., will to library by J. B. Curtis, \$20,000.
 Brady, Joseph B., New York, gift to Johns Hopkins Hospital, \$220,000.
 Brady, Nicholas, New York, gift to church work, \$110,000.
 Brigham, Mrs. S. W., New York, gift to schools, \$10,000.
 Brinks, Mrs. E. A., and Mrs. Donald McKay, gift to hospital, Englewood, N. J., \$100,000.
 Brooklyn Academy of Music, will by Charles A. Schieren, \$100,000.
 Brooklyn Institute of Arts and Sciences, will by Charles A. Schieren, \$22,975; will by R. B. Woodward, \$160,000.
 Brown, Augustus C., New York, will to charity, \$132,500.
 Brown, Phoebe C., Philadelphia, Pa., will to charity, \$6000.
 Brown, Sarah A., Nashua, N. H., will to church, \$10,000.
 Brown, Waldron P., New York, will to charity, \$10,000; will to church, \$10,000.
 Brown, W. W., Bend, Oreg., will to charity, \$500,000.
 Browne, W. W., Oregon, will to church, \$500,000.
 Brown University, gift by Jessie L. Rosenbeyer, \$7000; gift by unnamed donor, \$10,000.
 Brubaker, Lancaster, Pa., will to charity, \$5000.
 Brunt, James A. B., Anderson, Ind., gift to Y. M. C. A., \$125,000.

Brush, O. S., Philadelphia, Pa., will to charity, \$164,000.
 Buck, Asariah, Kankakee, Ill., will to home for aged, \$100,000.
 Buhl, Frank H., New York, gift to five cities in Chenango County, \$1,000,000; to Sharon, Pa., \$500,000.
 Busch, Mrs. Adolphus, gift to Harvard University, \$50,000.
 Cadman, Robert, Portland, Me., gift to church, \$60,000.
 Cadwalader, John L., New York, will to Harvard University, \$20,000; to New York Public Library, \$151,000; to New York Zoological Society, \$20,000; to Princeton University, \$25,000.
 Cains, James W., New York, will to charity, \$5000.
 Caldwell, Mrs. W. E., Macomb, Ill., gift to Illinois Holiness Association, \$20,000.
 Calef, Ira C., Washington, D. C., gift to Barre (Vt.) hospital, \$20,000.
 California, University of, gift by Cowell estate, \$400,000; by Ellen B. Scripps, \$100,000.
 Calumet and Hecla Mining Company, gift to employees, \$500,000; to miners, \$120,000.
 Canada Red Cross, gift by Henry Ford, \$10,000.
 Carnegie, Andrew, gift to Allegheny College, \$40,000; to benefit of blind, \$100,000; to Carnegie Institution, \$2,700,000; to Emory and Henry College, \$25,000; to Wellesley College, \$95,000; gift of library to Bedford, Iowa, \$10,000; gift of library to Dimba, Cal., \$8000; gift of library to Greensboro, Ga., \$6000; gift of library to Reading, Mass., \$15,000.
 Carnegie Foundation, gift to Stevens Inst. of Technology, \$250,000.
 Carroll College, will by I. S. Tripp, \$5000.
 Carson, Henry, Lancaster, Pa., will to charity, \$10,000.
 Chenango County, N. Y., gift to five cities in, by Frank H. Buhl, \$1,000,000.
 Chicago, Ill., gift to charity by unnamed donor, \$5000; gift to charity by various donors, \$158,325; gift to church by unnamed donor, \$16,000; gift to lying-in-hospital by various donors, \$25,000.
 Chicago Art Institute, unclaimed fund given by Columbian Exposition, \$47,000; by Mrs. A. A. Sprague, \$80,000.
 Chicago Symphony Orchestra, Chicago, Ill., gift by unnamed donor, \$5000; gift by Elizabeth S. Coolidge, \$100,000.
 Chicago Tribune's moving picture receipts to Belgium, \$30,000.
 Chicago University, gift of land to, \$25,000.
 Children, benefit of, gift by various donors, Chicago, Ill., \$43,000.
 Children's Hospital, gift by E. T. Stotesbury, \$50,000.
 Cincinnati Medical College, gift by various donors, \$1,000,000.
 Cincinnati Orchestra, will of Cora Dow, \$700,000.
 Clark, Charles H., Brattleboro, Vt., will to charity, \$50,000.
 Clark, Sarah M., Chicago, Ill., will to charity, \$5000; to church, \$20,000.
 Cleveland Art Museum, gift by Dudley P. Allen, \$100,000.
 Cleveland Medical Library, will by Dudley P. Allen, \$200,000.
 Cobb, John B., New York, gift to University of Virginia, \$50,000.
 Cobham, Henry, Warren, Pa., will to Salvation Army, \$100,000.
 Coffin, L. S., Fort Dodge, Iowa, will to charity, \$7000; to Lenox College, \$15,000; to Storm Lake College, \$20,000.
 Colby, H. F., Dayton, Ohio, will to church, \$8000.
 Coleman, Emma, New York, will to charity, \$6750.
 Coles, William W., New York, will to charity, \$100,000.
 College of St. Andrew, will by E. C. Walker, \$10,025.
 Columbian Exposition, unclaimed fund given to Chicago Art Institute, \$47,000.
 Columbia University, gift by Emile C. Bondy, \$100,000; gift by Amos F. Eno, \$80,000; gift by Albert F. Plant, \$15,000; gift by George W. Millorth, \$5000.
 Combs, Mr. and Mrs. J. F., Philadelphia, Pa., gift to charity, \$50,000.
 Compton, Lizzie, Elkhart, Ind., gift to Y. W. C. A., \$10,000.
 Connell, Agnes A., New York, will to charity, \$40,000.
 Connell, Amanda, Philadelphia, Pa., will to Drew Seminary, \$5000.
 Conrad, Norman, New Orleans, La., will to Tulane Library, \$5000.
 Coolidge, Elizabeth C., Pittsfield, Mass., gift to

Anti-tuberculosis Association, \$100,000; to art institute, \$100,000; to Chicago Symphony Orchestra, \$100,000.
 Coonley, Mrs. Avery, Chicago, Ill., gift to Vassar College, \$25,000.
 Cornell University, gift by George F. Baker, \$540,000.
 Coward, Martha A., Philadelphia, Pa., will to charity, \$5500.
 Cowell estate, San Francisco, Cal., gift to University of California, \$400,000.
 Cudahy heirs, Pasadena, Cal., gift to Sisters of Holy Name Academy, \$100,000.
 Cullamore, Helen, Boston, Mass., will to charity, \$685,000; to Institute of Technology, \$500,000; to Museum of Fine Arts, \$100,000; to Radcliffe College, \$20,000; to Simmons College, \$100,000.
 Currier, Hannah M., Manchester, N. H., will for art gallery, \$1,000,000.
 Curtis, J. B., Bradford, Me., will to library, \$20,000.
 D. A. R. Museum, gift by Mrs. A. H. Strong, \$50,000.
 Dartmouth College, gift by W. H. Hunt, \$20,000; will of Walter W. Hodges, \$25,000.
 Dato, Henry, Chicago, Ill., will to Methodist missions, \$40,000.
 Davenport, Orlando H., Boston, Mass., will to charity, \$500,000.
 Davidson, Sarah, Sanbornton, N. H., will to charity, \$85,000.
 Davies, Annie B., New York, gift to Metropolitan Museum of Fine Arts, \$50,000.
 Davis, Thomas A., Maysville, Ky., will to school library, \$7000.
 Dean, Edmund H., Darlington, S. C., will to charity, \$30,000.
 De Forrest, Mrs. M. F., Atchison, Kan., gift to hospital, \$60,000.
 Delaware College, gift by unnamed donors, \$900,000; by various donors, \$1,000,000.
 Del Drago, Josephine, New York, gift to Italian relief fund, \$2,000,000.
 Delehanty, Cornelius, Notre Dame, Ind., will to charity, \$21,000.
 Denham, William R., New York, will to charity, \$450,000.
 Denison University, gift by Rockefeller Foundation, \$125,000; by unnamed donor, \$100,000.
 Denver, University of, gift by Jacob Haish, \$100,000.
 Detroit, contributions to Belgian relief fund, \$38,000.
 Detroit Art Museum, will by E. C. Walker, \$25,000.
 Dickson, Samuel, Philadelphia, Pa., will to University of Pennsylvania, \$100,000.
 Diehl, Elizabeth, New York, will to charity, \$10,000.
 Diggins, Mrs. D. F., Cadillac, Mich., will to hospital, \$20,000.
 Dimba, Cal., gift of library by Andrew Carnegie, \$8000.
 Dobbs, Samuel C., Atlanta, Ga., gift to Emory University, \$50,000.
 Dodge, Grace E., New York, will to American College for Girls at Constantinople, \$25,000; to charity, \$50,000; to church, \$50,000; to Teachers College, Columbia University, \$500,000; to Y. M. C. A., \$25,000; to Y. W. C. A., \$700,000.
 Doran, Ellen M., Brookline, Mass., will to charity, \$6000.
 Dow, Cora, Cincinnati, Ohio, will to Cincinnati Orchestra, \$700,000.
 Draper family, Medford, Mass., gift to charity, \$100,000.
 Drew Seminary, will of Amanda Connell, \$5000.
 Duke, J. B., Durham, S. C., will to Methodist Church, South, \$100,000.
 Dunham, Eliza A., Lancaster, Pa., will to charity, \$12,000.
 Dunn, Moses F., Bedford, Ind., will to Purdue University, \$150,000.
 Dunwoody, Kate L., Minneapolis, Minn., will to charity, \$241,000; to Dunwoody Institute, \$1,500,000.
 Dunwoody Institute, will by Kate L. Dunwoody, \$1,500,000.
 Dupont, Pierre S., Philadelphia, Pa., gift to University museum, \$25,000; to University of Pennsylvania, \$25,000.
 Durfee, Sarah C., Providence, R. I., will to church, \$86,000.
 Dyckerhog, A., Fort Worth, Texas, will to orphans' home, \$25,000.
 Eastland steamer relief fund, gift by Chicago, Ill., \$346,180; total contributions, \$391,267.
 Eastman, George, Rochester, N. Y., gift to Friendly Home, \$50,000; to hospital, \$800,000.

East St. Louis, Ill., gift to church by various donors, \$19,000.
 Eckhart, Charles, Auburn, Ind., will to Western Advent Publications Society, \$12,500.
 Eckhart, John W., Chicago, Ill., gift to board of education, \$10,000.
 Eddy, Isaac H., Dorchester, Mass., will to charity, \$102,500.
 Eddy, Rebecca, Boston, Mass., will to charity, \$35,000.
 Educational purposes, gift by John Handley, \$1,500,000; gift by Mrs. D. H. Moore, \$100,000.
 Ellis, Charles E., Philadelphia, Pa., will for school for fatherless girls, \$1,000,000.
 Emerson, Charles W., Newton, Mass., will to church, \$400,000; to charity, \$25,000.
 Emerson, Frederick, Denver, Colo., gift to Red Cross, \$20,000.
 Emery, Mary, Cincinnati, Ohio, gift to hospital, \$50,000.
 Emory and Henry College, gift by Andrew Carnegie, \$25,000.
 Emory University, gift by Samuel C. Dobbs, \$50,000.
 Employees, gift to, by Kebler Piano Company, \$35,000; gift to, by Joseph E. Widener, \$100,000.
 Endicott, H. B., Boston, Mass., gift to charity, \$50,000.
 Engineering research, gift for, by Ambrose Swasey, \$100,000.
 Eno, Amos F., New York, will to charities, \$200,000; to Columbia University, \$80,000; to Mechanics and Tradesmen, \$1,800,000; to Metropolitan Museum, \$200,000; to Museum of Natural History, \$200,000; to New York Public Library, \$20,000; to New York University, \$200,000.
 Episcopal board of missions, annual donations to, \$1,087,000.
 Episcopal board of missions, New York, gift by various donors, \$70,790.
 Episcopal Church, general mission board of, gift by various donors, \$250,000.
 Episcopal Church home, Rochester, N. Y., gift by unnamed donor, \$5000.
 Episcopalian emergency fund, gift by various donors, \$400,000.
 Evansville Seminary, will by Cecilia Mygatt, \$10,000.
 Ewen, Caroline G., New York, will to charity, \$300,000.
 Exeter Academy, gift by various donors, \$51,000.
 Fannely, Mrs. Patrick, Norristown, N. J., will to charity, \$10,000.
 Farrar, Sarah J., New York, will to charity, \$35,000; to church, \$18,000.
 Fatherless girls, school for, will by Charles E. Ellis, \$1,000,000.
 Fecht, L. H., Birdsboro, Pa., gifts to church, \$15,000.
 Fennell, Frederick, New York, will to charity, \$6620.
 Ferry Museum, gift by Henry Hewitt, \$15,000; by Mrs. R. L. McCormick, \$10,000.
 Fields, Mrs. J. T., Manchester, Mass., will to education, \$6000.
 Finch, John A., Spokane, Wash., will to charity, \$1,658,000.
 Fitzgerald, Johanna, New York, will to charity, \$12,000.
 Fitzhugh, William M., San Francisco, Cal., gift to Golden Gate Park Museum, \$200,000.
 Florsheim, H. A., New York, will to charity, \$10,000.
 Foote, William B., Geneva, N. Y., wills to church, \$5000.
 Ford, Henry, Detroit, Mich., gift to Canada Red Cross, \$10,000; to peace fund, \$1,000,000.
 Foreman, Edwin G., Chicago, Ill., will to charity, \$50,000; to manual training schools, \$10,000.
 Forman, C. H., New Haven, Conn., will to Yale University, \$510,434.
 Foster, L. M., Marysville, Ky., will to charity, \$5000.
 Fowler, Edwin, Cleveland, Ohio, will to charity, \$86,000.
 Frank, Sarah, New York, will to charity, \$11,000.
 Frazer, Harriet M., Philadelphia, Pa., will to charity, \$19,500.
 Freedman, Andrew, New York, will to charity, \$2,500,000.
 Freer, Charles L., Detroit, Mich., gift to Smithsonian Institution, \$1,000,000.
 French, Daniel C., memorial gift to Art Institute, Chicago, Ill., \$11,000.
 French, Sarah A., San Antonio, Tex., will to charity, \$15,000; to church, \$40,000.
 Frick, Henry, Pittsburgh, Pa., gift to charity, \$167,000.

Friendly home, gift by George Eastman, \$50,000.
 Friendly home, Rochester, N. Y., gift by various donors, \$200,000.
 Fund for unemployed, New York, gift by various donors, \$115,000.
 Furness, Clementina A., Lenox, Mass., will to charity, \$6000.
 Galbraith, Matilda, Philadelphia, Pa., will to charity, \$20,000.
 Galveston relief fund, contributions to, \$17,000.
 Gamble, Fannie M., Cincinnati, Ohio, will to preachers' pensions, \$125,000.
 Gamble, Mary A., Montpelier, Vt., will to charity, \$5000.
 Garneau family, St. Louis, Mo., gift to church, \$25,000.
 Garrett, Mary A., Humboldt, Kan., will to charity, \$7300.
 Gary, E. H., and Charles M. Schwab, gift of armored train to New York National Guard, \$150,000.
 Gates, H. T., Worcester, Mass., will to church, \$5000.
 General relief, gift by Julius Rosenwald, \$100,000.
 Geisinger, Mrs. A. A., gift of hospital to Danville, Pa., \$600,000.
 Georgetown College, gift by Edward Key, \$15,000.
 Georgia State Hospital for Cripples, gift by various donors, \$100,000.
 German and Austrian widows, gift by various donors, St. Louis, Mo., \$100,000.
 Gilder, Rosina, Penn Yan, will to charity, \$5000.
 Gilmartin, George E., White Plains, N. Y., will to church, \$10,000.
 Gilton, O. J. M., Alton, Mass., will to charity, \$35,000; to church, \$20,000; to library, \$17,000.
 Golden Gate Park Museum, gift by William M. Fitzhugh, \$200,000; gift by Japanese, \$75,000.
 Goldthwaite, Ellen A. R., Boston, Mass., will to charity, \$78,000; to church, \$14,000.
 Goodman, George F., Newton, will to Trinity College, \$5000.
 Goodman, Mrs. James J., Hartford, Conn., gift to Wadsworth Atheneum, \$50,000.
 Goodwin, James J., Hartford, Conn., gift to charity, \$25,000.
 Goodyear, Mrs. C. W., Buffalo, N. Y., gift to Yale University, \$10,000.
 Gordon, Randall R., Stonington, Ill., will to church, \$70,000.
 Gouyon, Camille, Keene, N. H., will to church, \$40,000.
 Graham, James M., Memphis, Tenn., will to charity, \$50,000.
 Gray, John C., Boston, Mass., will to Harvard University, \$25,000.
 Gray, Sarah E., Portsmouth, N. H., will to charity, \$5000.
 Greene, Mary H., Dayton, Ohio, will to charity, \$10,000; to church, \$70,000.
 Greensboro, Ga., gift of library by Andrew Carnegie, \$6000.
 Greenwood, Mrs. T. K., Augusta, Mass., will to hospital, \$6000.
 Gregg, Edward R., Pittsburgh, Pa., will to hospital, \$10,000.
 Griffin, G. P., Chicago, Ill., gift to Lincoln Park, \$20,000.
 Griffins, George P., Brooklyn, N. Y., will to charity, \$15,000.
 Gross, L. B., Montpelier, Vt., will to church, \$5000.
 Grund, George A., Kansas City, gift to city, \$100,000.
 Guggenheim Bros., New York, gift to Mount Sinai Hospital, \$250,000.
 Guinnell, Julia, New York, will to church, \$12,656.
 Haines, Charles, Aurora, Ill., will to Mercy Hospital, Chicago, Ill., \$333,883; to schools, \$166,666.
 Haish, Jacob, DeKalb, Ill., gift to University of Denver, \$100,000.
 Hale, Rose A., Boston, Mass., will to charity, \$1000.
 Hall, Charles M., will to Oberlin College, \$3,000,000.
 Hamilton, Adelaide, New York, will to charity, \$8000.
 Hampton Institute, gift by unnamed donor, \$40,000.
 Hancock, W. S., Trenton, N. J., will to charity, \$80,000; to hospital, \$500,000.
 Handley, John, Scranton, Pa., will for educational purposes, \$1,500,000; for library, \$200,000.
 Harnier, Jane H., Germantown, Pa., will to charity, \$7500.
 Harris, Norman B., Chicago, Ill., gift to Northwestern University, \$50,000.
 Harris, Mr. and Mrs. N. W., Chicago, Ill., gift to Mount Holyoke College, \$25,000.

- Harvard medical school, gift by various donors, \$22,908; will by Philip C. Lockwood, \$50,000.
- Harvard University, gift by George R. Agassiz, \$25,000; by Mrs. Adolphus Busch, \$50,000; by James J. Hill, \$125,000; estate of Francis Skinner, \$48,000; estate of H. M. Wyman, \$75,000; by various donors, \$561,000; will by John M. Cadwalader, \$20,000; will by John C. Gray, \$25,000; will by J. J. Myers, \$100,000.
- Harvard University corporation, gifts to Belgian professors, \$100,000.
- Haskell, J. H., Portland, Me., will to charity, \$8000.
- Hatel, W. C., Highland Park, Ill., gift to hospital, \$10,000.
- Haughton, Eliza H., Cambridge, Mass., will to church, \$5000.
- Hawley, J. L., Los Angeles, Cal., will to charity, \$110,000.
- Hebrew relief fund, Pasadena, Cal., gift by various donors, \$25,000.
- Hebrew Technical Institute, New York, gift by various donors, \$150,000.
- Hedding College, gift by unnamed donor, \$50,000.
- Henderson, Ky., gift to hospital by unnamed donor, \$15,000.
- Hepburn, H. D., New York, gift to Middlebury College, \$200,000.
- Heppe, F. J., Philadelphia, Pa., gift to charity, \$50,000.
- Hercules Powder Co., Dover, N. J., gift of clubhouse to employees, \$15,000.
- Herring, William P., Watertown, N. Y., will to found Herring College, \$1,000,000.
- Herring College, will to found, by William P. Herring, \$1,000,000.
- Hersey, S. S., Auburn, Me., will to charity, \$80,000.
- Hewes, David, Santa Ana, Cal., will to charity, \$6000; to Mills College, \$20,000.
- Hewitt, Henry, Tacoma, Wash., gift to Ferry Museum, \$15,000.
- Hill, James J., gift to Harvard University, \$125,000; to Marquette University, \$10,000.
- Hill, Laura J., Lexington, Mass., will to charity, \$12,000.
- Hill, Martha S., Chicago, Ill., will to Art Institute, \$30,000.
- Hilldale College, gift by Eugene A. Merrill, \$30,000; gift by Bale Brothers, \$30,000; gifts by various donors, \$30,000.
- Hinchliff, John, Paterson, N. J., will to charity, \$65,000.
- Hinckley, Sarah S., Oxford, Ohio, will to church, \$19,000.
- Historical Society, gift by Abram Nesbit, \$8000.
- Hobart College, gift by Rockefeller Foundation, \$50,000.
- Hobbes, James B., Chicago, Ill., will to charity, \$7000.
- Hodges, Walter W., Brookline, Mass., will to charity, \$65,000; to church, \$10,000; to Dartmouth College, \$25,000.
- Holden, A. F., Cleveland, Ohio, will for cemetery arboretum, \$200,000.
- Holy Name, Sisters of, gift by Oudahy heirs, \$100,000.
- Home for aged, will by Azariah Buck, \$100,000.
- Home for homeless, gift by unnamed donor, Boston, Mass., 100,000.
- Home for working girls, Cleveland, Ohio, gift by various donors, \$16,000.
- Hood, Eleanor P., Providence, R. I., will to church, \$20,000.
- Hooker, Mrs. Ellen, Greenwich, Conn., gift to Vassar College, \$25,000.
- Hope, J. S., Philadelphia, Pa., will to hospital, \$25,000.
- Hopp, C. J., and Son, Philadelphia, Pa., gift to charity, \$10,000.
- Hotchkiss, J. H., New Haven, Conn., will to Yale University, \$1,000,000.
- Howard, Alice M., New York, will to charity, \$29,815.
- Howland family, New York, gift to Yale University, \$15,000.
- Hudson, Joseph, Detroit, Mich., will to University of Michigan, \$75,000.
- Hunt, John W., Georgia, will to charity, \$1,000,000.
- Hunt, W. H., Needham, Mass., will to Dartmouth College, \$20,000.
- Huntington, A. M., New York, gift to National Institute of Art and Letters, \$77,000.
- Huntington, Mrs. H. E., gift of children's park to San Francisco, \$275,000.
- H. W. Johns-Manville Co., New York, gift to Stevens Technical Institute, \$10,000.
- Illinois Holiness Association, gift by Mrs. W. E. Caldwell, \$20,000.
- Illinois Synod of Presbyterian Church, gift by unnamed donor, \$50,000; by various donors, \$125,000.
- Illinois University, gift by Edmund F. James, \$5000; gift by various donors, \$40,000.
- Illinois Wesleyan College, gift by various donors, \$150,000.
- Ingraham, Robert, Fond du Lac, Wis., gift to charity, \$8000.
- Indiana University, gift by Robert W. Long, \$170,000; gift by L. D. Waterman, \$100,000.
- Iowa Methodist preachers' relief fund, gift by various donors, \$22,500.
- Italian relief fund, gift by Josephine Del Drago, \$2,000,000.
- Jackson, Mrs. E. E., Salisbury, Md., gift to Y. M. C. A., \$50,000.
- James, Edmund F., Champaign, Ill., gift to University of Illinois, \$5000.
- Japanese gift to Golden Gate Park Museum, \$75,000.
- Jefferson Medical College, Philadelphia, Pa., gift by unnamed donor, \$100,000.
- Jessup, Mrs. Van Antwerp DeWitt, New York, will to charity, \$865,608; to church, \$1,850,000; to education, \$516,000; to Metropolitan Museum, \$800,155; to Museum of Natural History, \$5,128,880; to Williams University, \$800,000; to Yale University, \$800,000.
- Jewell High School, Jewell, Iowa, will by Benjamin Musser, \$80,000.
- Jewish charities, Chicago, Ill., gift by various donors, \$7000.
- Jewish contribution, New York, to war relief fund, \$200,000.
- Jewish relief fund, gift by various donors, \$65,700.
- Jewish sufferers, gift by various donors, \$100,000.
- Jewish work in Palestine, gift by various donors, \$100,000.
- Johns Hopkins Hospital, gift by Joseph B. Brady, \$220,000.
- Johns Hopkins Institute, will by J. T. Teasler, \$20,000.
- Johns Hopkins University, gift by unnamed donor, \$100,000; gift by various donors, \$200,000; will by James M. Beall, \$37,500.
- Johnson, C. S. C., Los Angeles, Cal., will to church, \$200,000.
- Johnson, O. T., Los Angeles, Cal., gift to charity, \$100,000.
- Johnson, Mr. and Mrs. O. T., Los Angeles, Cal., gift to charity, \$100,000.
- Johnson, Seth, Moravia, Iowa, will to charity, \$30,000.
- Joplin, Mo., gift of park to city by Charles Scheffendecker, \$100,000.
- Joy, Mrs. James, Boston, Mass., gift to church, \$5000.
- Kalamazoo College, gift by Rockefeller education board, \$25,000.
- Kansas, gift to Belgium, \$500,000.
- Kebler Piano Co., New York, gift to employees, \$35,000.
- Keep, Albert, Chicago, Ill., will to Y. M. C. A., \$200,000.
- Kellogg, Mary B., Syracuse, N. Y., will to church, \$20,000; to library, \$20,000.
- Kerens, Richard, St. Louis, Mo., gift to church, \$75,000.
- Kerr, John J., Quincy, Ill., gift to church, \$10,000.
- Key, Edward, Baltimore, Md., will to charity, \$20,000; to Georgetown College, \$15,000.
- Kimball, Ada R., Philadelphia, Pa., will to charity, \$11,000.
- Kimball, Louise E., Chicago, Ill., will to charity, \$15,000.
- Kimberg, Peter L., Sharon, Pa., will to charity, \$500,000.
- Kinney, Orlando, Norwich, Conn., will to church, \$7000.
- Knickerbocker Hospital, will by G. H. Wright, \$580,000.
- Knights of Columbus, gift to Marquette College, \$50,000.
- Knox College, gift by Ellen B. Scripps, \$100,000; gift by unnamed donor, \$50,000.
- Lafayette College, gift by Rockefeller education board, \$25,000.
- Land, Antoinette W., Baltimore, Md., will to missions, \$4000.
- Lathers, Jane K., Berkeley, Cal., gift to charity, \$88,000.
- Lavanburg, Amelia, New York, will to charity, \$60,000.
- Lawrence, Samuel, New York, will to charity, \$88,668.
- Leach, Elsie, New York, will to charity, \$81,000.

Leland Stanford University art museum, gift by Thomas W. Stanford, \$80,000.
 Lenox College, will by L. S. Coffin, \$15,000.
 Levy, Herman, San Francisco, Cal., will to charity, \$150,000.
 Levy, Samuel, Wilkesbarre, Pa., will to charity, \$8120.
 Lewis, Paul, Elizabethtown, N. J., gift to charity, \$30,000.
 Lincoln Park, Chicago, Ill., gift by G. P. Griffin, \$20,000; gift by unnamed donor, \$20,000.
 Lindgren, John R., Chicago, Ill., will to church, \$500,000; to Northwestern University, \$500,000.
 Lindsay, William, Boston, Mass., gift to American hospital, Paris, \$10,000.
 Lippe, Elizabeth A., will to charity, \$15,900; to church, \$11,000.
 Lockwood, Philip C., Boston, Mass., will to Harvard medical school, \$50,000.
 Loewenthal, Julius W., Chicago, Ill., will to charity, \$30,000.
 Long, Robert W., Indianapolis, Ind., will to Indiana University, \$170,000.
 Louisville, Ky., gift to charity by various donors, \$150,000.
 Lusitania sufferers, gift by various donors, New York, \$15,000.
 Lying-In Hospital, Chicago, Ill., gift by Ogden Armour, \$10,000; a second gift by Julius Rosenwald, \$100,000.
 Lyndon Institute, gift by Theodore N. Wait, \$50,000.
 McCauley, Sarah E., Philadelphia, Pa., will to charity, \$8000.
 McCormick, Mrs. R. L., Tacoma, Wash., gift to Ferry Museum, \$15,000.
 McCullough, John G., Bennington, Vt., will to library, \$10,000.
 McDowell, Annie, Yonkers, N. Y., will for spinsters' home, \$50,000.
 McElwell, Thomas A., Philadelphia, Pa., will to charity, \$10,300.
 McHarg, Harriet P., New York, will to church, \$24,000.
 McIlheney, John, Philadelphia, Pa., gift to school at Columbus, Ga., \$20,000.
 McKay, Alexander A., Chicago, Ill., will to Art Institute, \$100,000; to charity, \$100,000.
 McKay, Mrs. Donald, and Mrs. E. A. Brinks, gift to hospital, Englewood, N. J., \$100,000.
 McKay, Gordon, will to Harvard, transfers to Massachusetts Polytechnic Institute, \$5,500,000.
 McLean, Mary L. A., White Plains, N. Y., will to charity, \$5500.
 McMillan, Mrs. W. A., St. Louis, Mo., will to charity, \$2,000,000; to Washington University, \$1,000,000.
 Mair, Charles A., Chicago, Ill., will to charity, \$30,000.
 Mair, C. A., Chicago, Ill., will to charity, \$10,000.
 Major, William S., Harbor Springs, Mich., will to hospital, \$50,000.
 Manual training schools, will by Edwin G. Foreman, \$10,000.
 Marquette College, gift by Knights of Columbus, \$50,000.
 Marquette University, gift by James J. Hill, \$10,000.
 Marshall, W. H., Harrisonburg, Va., will to hospital, \$15,000.
 Martin, John K., Bridgeton, Me., will to charity, \$450,000.
 Masonic gift of hospital at Sullivan, Ill., \$50,000.
 Masonic hospital, Elizabethtown, Pa., gifts to, \$53,000.
 Massachusetts Institute of Technology, gift by various donors, \$1,000,000.
 Massachusetts Institute of Technology, will by Gordon McKay, \$5,500,000.
 Massie, L. J., Long Beach, Cal., gift to charity, \$10,000.
 Matthewson, Charles F., New York, will to Dartmouth College, \$200,000.
 Maul, W. G., Chicago, Ill., will to charity, \$100,000.
 Mayer, Seligman, New York, will to charity, \$60,000.
 Mayo, Drs. William and Charles, Rochester, Minn., gift for medical research, \$1,000,000; to University of Minnesota, \$2,000,000.
 Mechanics and Tradesmen, Society of, gift by Amos F. Eno, \$1,800,000.
 Medical research, gift for, by Drs. William and Charles Mayo, \$1,000,000.
 Melton, Pa., gift to church by unnamed donor, \$50,000.
 Mental Hygiene Institute, gift by Elizabeth Anderson, \$50,000; gift by Mrs. W. K. Vanderbilt, \$40,000.

Mercy Hospital, Chicago, Ill., will by Charles Haines, \$333,333.
 Mercy hospital, Kansas City, Mo., gift by various donors, \$36,000.
 Mercy Hospital, Philadelphia, Pa., gift by various donors, \$200,000.
 Merrill, Eugene A., Indianapolis, Ind., gift to Hillsdale College, \$30,000.
 Merrill, Lydia M., Exeter, N. H., will to charity, \$25,000.
 Messerole, Evaline A., New York, will to charity, \$75,000.
 Methodist Church, Nebraska, gift by various donors, \$70,000.
 Methodist Church, South, gift by J. B. Duke, Durham, S. C., \$100,000.
 Methodist missions, will by Henry Dato, \$40,000.
 Metropolitan Museum, gift by Annie B. Davies, \$50,000; gift by Amos F. Eno, \$200,000; will by John M. Cadwalader, \$43,475; will by Mrs. Van Antwerp De Witt Jessup, \$800,155.
 Meyers, Mrs. George H., Lehigh, Pa., gift to charity, \$7000.
 Michigan, University of, gift by various donors, Detroit, Mich., \$250,000; will by Joseph Hudson, \$75,000.
 Middlebury College, will by Joseph Battell, \$220,000.
 Middlebury College, gift by A. D. Hepburn, \$200,000.
 Mietz, August, New York, will to charity, \$9000.
 Miller, Henry, New York, will to hospitals, \$224,157.
 Millorth, George W., Philadelphia, Pa., will to Stevens Institute of Technology, \$5000; to University of Columbia, \$5000; to University of Pennsylvania, \$5000.
 Mills College, will by David Hewes, \$20,000.
 Milton, Pa., gift to church by unnamed donor, \$50,000.
 Miner, W. H., Chicago, Ill., gift to Art Institute, \$50,000.
 Miners, gift by Calumet and Hecla, \$120,000.
 Ministerial relief, gift by unnamed donor, New York, \$80,000.
 Minneapolis, Minn., Tag day for charity, \$24,396.
 Minnesota, University of, gift by Mayo brothers, \$2,000,000.
 Missions, will by Ida Shapley, \$182,500; will by Edward A. Webb, \$400,000.
 Mittelberger, Augusta, Cleveland, Ohio, will to charity, \$10,000.
 Morgan, David N., Concord, N. H., will to charity, \$10,500.
 Morgan, J. P., New York, gift to Seaman's Church Institute, \$50,000.
 Morningside College, gift by various donors, \$35,000.
 Moore, Mrs. D. H., Ottawa, Ill., will for educational purposes, \$100,000.
 Morris, Edward, Chicago, Ill., will to charities, \$55,000.
 Morristown, N. J., will to city by Frances E. Woodruff, \$50,000.
 Morse, Calantha E., Boston, Mass., will to charity, \$5500.
 Mosely, John, Needham, Mass., will to church, \$6000.
 Moses, Galen C., Bath, Me., will to Y. M. C. A., \$15,000.
 Moulton, Charles, Waltham, Mass., will to charity, \$7500.
 Mount Holyoke College, gift by Mr. and Mrs. N. W. Harris, \$25,000.
 Mount Sinai Hospital, gift by Guggenheim Bros., \$250,000.
 Muhlenberg College, gift by various donors, Allentown, Pa., \$67,000.
 Munsey, Frank A., New York, gift to American hospital at Paris, \$50,000.
 Murphy, Eunice L., Philadelphia, Pa., will to charity, \$20,000.
 Murray, Mrs. J. T., New York, will to charity, \$371,640.
 Museum of Fine Arts, Boston, Mass., will of Helen Cullamore, \$100,000.
 Museum of Natural History, will by Mrs. Van Antwerp De Witt Jessup, \$5,123,880; gift by Amos F. Eno, \$200,000.
 Musser, Benjamin, Jewell, Iowa, will to Jewell High School, \$80,000.
 Myers, F. E. and P. A., Ashland, Ohio, gift to Wittenberg College, \$20,000.
 Myers, J. J., Boston, Mass., will to Harvard University, \$100,000.
 Mygatt, Cecilia, Evansville, Ind., will to Evansville Seminary, \$10,000.
 Nagle, Rosanna M., New York, will to charity, \$5000; to church, \$5000.

National Aéro fund, gift by Mrs. W. H. Bliss, \$10,000.
 National Institute of Art and Letters, gift by A. M. Huntington, \$77,000.
 Needle guild, Washington, Ill., gift to charity, \$6000.
 Nesbit, Abram, Wilkesbarre, Pa., gift to Historical Society, \$8000.
 Neas, Mary J., Jamaica Plain, Mass., will to church, \$30,000.
 Nevil, George, Philadelphia, Pa., gift to church, \$5000.
 Newcomb, George W., Bridgton, Me., will to charity, \$40,000.
 New York, gift to charity by various donors, \$107,010.
 New York National Guard, gift of armored train to, by Charles M. Schwab and E. H. Gary, \$150,000.
 New York Public Library, will by John M. Cadwalader, \$151,000; will by G. H. Wright, \$100,000.
 New York University, gift by Amos F. Eno, \$200,000.
 New York Zoölogical Society, will by John M. Cadwalader, \$20,000.
 New Salem Academy, will by H. W. Ballard, \$10,000.
 Nicholson, J. S., Salina, Kan., gift to Y. M. C. A., \$10,000.
 Northfield schools, will by H. W. Berry, \$8000.
 Northwestern University, gift by Norman B. Harris, \$50,000; gift by James A. Patten, \$27,000; gift by Mrs. G. F. Swift, \$8000; will by John R. Lindgren, \$500,000.
 Oberlin College, will by Charles M. Hall, \$8,000,000.
 O'Connor, Elizabeth, New York, will to church, \$80,000.
 O'Donnell, Edward R., St. Louis, Mo., will to charity, \$20,000.
 Onarga Presbyterian Seminary, gift by W. A. E. Rankin, \$50,000.
 Oppenheim, J. E., Philadelphia, Pa., will to charity, \$10,000.
 Orphans' home, Fort Worth, Texas, will by A. Dyckerhog, \$25,000.
 Osborn, Mrs. W. C., New York, gift to Princeton University, \$100,000.
 Palache, Whitney, Hartford, Conn., gift to charity, \$10,000.
 Park, W. G., Mineola, L. I., will to church, \$40,000.
 Parker, Carrie, Sioux Falls, Iowa, will to charity, \$5450.
 Parkman, Grace, Dorchester, Mass., will to charity, \$15,000.
 Paterson, N. J., gift to church by various donors, \$25,000.
 Patten, James A., Chicago, Ill., gift to charity, \$75,000; to Northwestern University, \$27,000.
 Peace fund, gift by Henry Ford, \$1,000,000.
 Pearson, Frederick S., will to charity, \$100,000; to Tufts College, \$500,000.
 Pecker, Jonathan E., Concord, N. H., will to charity, \$30,000; to church, \$20,000.
 Peifer, George F., Philadelphia, Pa., will to charity, \$5000.
 Pennsylvania Academy of Fine Arts, will by Susan F. Wharton, \$5000.
 Pennsylvania College, gift by various donors, \$30,000.
 Pennsylvania, University of, gift by Pierre S. Dupont, \$25,000; will by Samuel Dickson, \$100,000; will by George Millorth, \$5000.
 Persohn, William, Chicago, Ill., will to charity, \$25,000.
 Peterson, M. D., Davenport, Iowa, will to charity, \$1,000,000.
 Philadelphia, Pa., gift to charity by various donors, \$103,500; gift to Children's Hospital by various donors, \$500,000; to church by unnamed donor, \$20,000; to church by unnamed donor, \$5000; to Red Cross by unnamed donor, \$10,000.
 Phillips Exeter Academy, gift by William Thompson, \$100,000.
 Pierce, Luther H., Chicago, Ill., residuary legacy to charity, \$500,000.
 Pine, Charles H., Ansonia, Conn., will to manual training school, \$250,000; to Yale University, \$150,000.
 Pittsburgh, Pa., gift to charity (Sacrifice day), by various donors, \$10,000.
 Plant, Albert F., New York, will to Columbia University, \$15,000.
 Polish relief, gift by various donors, Chicago, Ill., \$10,000.
 Pomona College, gift by Rockefeller Foundation, \$100,000; gift by various donors, \$100,000.
 Powell, W. M., New York, will to charity, \$9000.

Powers, W. J., Philadelphia, Pa., will to charity, \$16,900.
 Preachers' pensions, gift by Fannie M. Gamble, \$125,000.
 Preger, Catherine J., New York, will to charity, \$62,258.
 Presbyterian Hospital, New York, will by Albert A. Sprague, \$50,000.
 Prescott, Nellie S., Cloverdale, Cal., will to charity, \$360,000; to church, \$140,000.
 Princeton University, gift by Mrs. W. C. Osborn, \$125,000; gift by Mrs. Russell Sage, \$250,000; gift by unnamed donor, \$100,000; gift by various donors, \$819,252; will by John M. Cadwalader, \$25,000.
 Protestant Orphan Asylum, New York, will by Albert A. Sprague, \$5000.
 Purdue University, will by Moses F. Dunn, \$150,000.
 Raintzer, Simon, New York, will to charity, \$6000.
 Rankin, W. A. E., Bloomington, Ill., gift to Onarga Presbyterian Seminary, \$50,000.
 Rankin, W. A., Onarga, Ill., gift to church, \$50,000.
 Ransom, Nathaniel M., Somerville, Mass., will to church, \$8000.
 Ratchesky, A. O., Boston, Mass., gift to charity, \$100,000.
 Reading, Mass., gift of library by Andrew Carnegie, \$5000.
 Red Cross fund, gift by Rockefeller Foundation, \$50,000.
 Red Cross, gift by Frederick Emerson, \$20,000; gift by Rockefeller Foundation to check typhoid, \$20,000; by unnamed donor, \$10,000; by unnamed donor, Boston, Mass., \$10,000.
 Reed, Marie, Baltimore, Md., will to charity, \$6000.
 Rehm, Jacob, Chicago, Ill., will to charity, \$15,000.
 Rehm, Peter R., Philadelphia, Pa., will to charity, \$20,000.
 Reiff, W. E., Pottsville, Pa., will to charity, \$50,000.
 Relief ship for Belgium, \$550,000.
 Relief ship cargo for Belgium, \$500,000.
 Rensselaer Institute, gift by A. T. White, \$50,000.
 Revel, Augustus, Norristown, N. J., will to church, \$25,000.
 Rhinelander, Charles E., New York, will to charity, \$50,000.
 Rice, Mrs. I. L., New York, gifts for hospital, \$1,000,000.
 Richardson, C. L., Manchester, N. H., will to charity, \$25,500.
 Ripon College, will by I. S. Tripp, \$5000.
 Risdale, Elizabeth, Philadelphia, Pa., will to charity, \$68,000.
 Roberts, Sarah E., Portland, Me., will to charity, \$5500.
 Robeson, Samuel J., Philadelphia, Pa., to charity, \$50,000.
 Rochester, N. Y., gift to general hospital by various donors, \$22,000.
 Rockefeller, John D., gift to Baptist missionary societies, \$100,000; to Michigan University Y. M. C. A., \$60,000; to Seaman's Church Institute, \$50,000.
 Rockefeller, Mrs. J. D., New York, will to charity, \$2,500,000.
 Rockefeller, J. D., Jr., gift to charity, \$18,000.
 Rockefeller education board to Hobart College, \$50,000; to Lafayette College, \$200,000; to Kalamazoo College, \$25,000.
 Rockefeller Foundation, gift for laboratory for study of animal diseases, \$1,000,000; gift to American Baptist Foreign Mission Society, \$50,000; to American Red Cross, \$25,000; to Armenian relief fund, \$80,000; to Denison University, \$125,000; to Mexican Red Cross fund, \$50,000; to Pomona College, \$100,000; to Red Cross to check typhoid, \$20,000; to Southern secondary schools, \$140,000; to unemployed Colorado miners, \$100,000; to Vassar College, \$200,000; to Yale Chinese Medical College, \$16,200; to Y. M. C. A., \$100,000.
 Rodney, Susan C., Philadelphia, Pa., will to charity, \$12,000.
 Roebeling, F. W., Trenton, N. J., gift to charity, \$20,000.
 Roosevelt, Theodore, New York, gift to charity, \$40,000.
 Rosenbeyer, Jessie L., Chicago, Ill., gift to Brown University, \$7000.
 Rosenwald, Julius, Chicago, Ill., gift to colored Y. M. C. A., \$25,000; to general relief, \$100,000; to Lying-in Hospital, \$100,000; to Tuskegee Institute, \$5000; to Woman's Club, \$50,000.
 Sage, Mrs. Russell, New York, gift for animal protection, \$15,000; gift to Armenian relief fund, \$5000; gift to charity, \$60,000; to Princeton University, \$250,000; to Syracuse University, \$16,000.
 St. Louis flood relief fund, gift by various donors, \$50,000.
 St. Xavier College, will by Julia E. Yunivet, \$5000.

- St. Louis, Mo., gift to church by various donors, \$8000.
- San Francisco, gift to children's park by Mrs. H. E. Huntington, \$275,000.
- Saul, Julius, New York, will to charity, \$5000.
- Scanlon, J. K., Elgin, Ill., will to charity, \$19,000.
- Scattergood, Elizabeth S., Philadelphia, Pa., will to charity, \$10,000.
- Schefer, Henry, Philadelphia, Pa., will to charity, \$6500.
- Schwab, Charles M., gift to charity, \$15,000.
- Schwab, Charles M., and E. H. Gary, gift of armored train to New York National Guard, \$150,000.
- Schwabacher, Morris, Chicago, Ill., will to charity, \$17,000.
- Scripps, Ellen B., La Jolla, Cal., gift to Knox College, \$100,000; to University of California, \$100,000.
- Seaman's Church Institute, gift by J. P. Morgan, \$50,000; gift by J. D. Rockefeller, \$50,000; gift by various donors, \$122,202.
- Searle, Miss C. A., New York, will to Seashorehome, \$10,000.
- Seashorehome, will by Miss C. A. Searle, \$10,000.
- Schieren, Charles A., New York, will to Brooklyn Academy of Music, \$100,000; to Brooklyn Institute of Arts, \$22,975.
- Schiff, Mrs. C. H., New York, gift to University of Virginia, \$50,000.
- Schiff, Jacob H., New York, gift to Barnard College, \$500,000; to Jewish relief fund, \$25,000; to Stevens Technical Institute, \$5000.
- Schiffendecker, Charles, Joplin, Mo., gift of park to city, \$100,000.
- Schmidt, John, Springfield, Mo., will to charity, \$10,000.
- Schools, gift to, by Mrs. S. W. Brigham, \$10,000.
- Settlements, gift to, by various donors, New York, \$50,000.
- Seventh Day Adventists, Boulder, Colo., gift to church, \$10,000.
- Shapley, Ida, Baltimore, Md., will to missions, \$182,500.
- Sharon, Pa., gift to town by Frank H. Buhl, \$500,000.
- Shawn, Nathan, New York, gift to Zion movement, \$35,000.
- Shaw, Samuel S., Boston, Mass., will to library, \$5000.
- Sheftel, Mrs. Herbert, New York, gift to Yale University, \$10,000.
- Sheppard, Marie J., Revere, Mass., will to charity, \$11,150.
- Shirley, Louise F., San Diego, Cal., will to charity, \$17,000.
- Simmons College, will by Helen Cullamore, \$100,000.
- Sioux City, Iowa, to church by various donors, \$20,000.
- Sizer, Katherine M., New Haven, Conn., will to charity, \$50,000.
- Skinner, Francis, estate of, gift to Harvard University, \$43,000.
- Slimmer, Abraham, Dubuque, Iowa, gift to charity, \$25,000; to hospital, \$30,000.
- Sloane, William D., New York, will to charity, \$170,000.
- Sloane, Mrs. W. D., New York, gift to charity, \$10,000.
- Slocum, Charles E., Defiance, Ohio, will to Washington University, \$10,000.
- Smith, Annie E., will to Barnard College, \$10,000; to charity, \$252,000.
- Smith, Mary A., Chelsea, Mass., will to charity, \$5000.
- Smithsonian Institution, gift by Charles L. Freer, \$1,000,000.
- Southern secondary schools, gift by Rockefeller Foundation, \$140,000.
- Southmayd, Charles F., New York, will to charity, \$10,000.
- South Shore Country Club fair, Chicago, Ill., to charity, \$75,000.
- Spinners' home, will by Annie McDowell, \$50,000.
- Sprague, Albert A., Chicago, Ill., will to Art Institute, \$50,000; will to Presbyterian Hospital, \$50,000; will to Protestant Orphan Asylum, \$5000.
- Sprague, Mrs. Albert A., Chicago, gift to Art Institute, \$90,000; to charity, \$100,000.
- Superannuated ministers, gift by various donors, \$330,000.
- Stanford, Thomas W., gift to Leland Stanford University art museum, \$80,000.
- State air craft, gift by various donors, New York, \$20,000.
- Stevens Institute of Technology, gift by Babcock and Wilcox, \$25,000; gift by Carnegie Foundation, \$250,000; gift by H. W. Johns-Manville Co., \$10,000; gift by J. H. Schiff, \$5000; gift by unnamed donor, \$10,000; gift by various donors, \$171,600; gift by Edward Weston, \$10,000; will by George W. Millorth, \$5000.
- Stick, A. C., Independence, Kan., will to Washburne College, \$75,000.
- Stillman, James, New York, gift to American Relief Clearing House, Paris, \$100,000.
- Storm Lake College, will by L. S. Coffin, \$20,000.
- Stotesbury, E. T., Philadelphia, Pa., gift to Children's Hospital, \$50,000.
- Stott, Sophie F., New York, will to charity, \$37,000.
- Strait, Mrs. W. D., Westbury, L. I., gift to church, \$5000.
- Straus, Nathan, New York, gift to Jewish relief fund, \$50,000.
- Strong, Mrs. A. H., New Brunswick, N. J., gift to D. A. R. Museum, \$50,000.
- Swartley, Anna, Launsdale, Pa., will to charity, \$50,000.
- Swaney, Ambrose, Cleveland, Ohio, gift for engineering research, \$100,000.
- Swift, Mrs. G. F., Chicago, Ill., gift to charity, \$10,000; to Northwestern University, \$8000.
- Syracuse University, gift by Mrs. Russell Sage, \$16,000.
- Taylor, M. E., Louisville, Ky., to charity, \$20,000.
- Teachers College of Columbia University, will by Grace Dodge, \$500,000.
- Teassler, J. T., Sunbury, Pa., will to charity, \$6000; to church, \$7000; to Johns Hopkins Institute, \$20,000.
- Technology, Institute of, will by Helen Cullamore, \$500,000.
- Texas, University of, gift by J. W. Brackenrip, \$100,000.
- Thomas, Cleo A., Brookline, Mass., wills to church, \$5000.
- Thompson, Elizabeth, New York (trust estate), will to charities, \$8,250,000.
- Thompson, Jasper, Forest City, Iowa, gift of park to town, \$100,000.
- Thompson, W. H., Pittsburgh, Pa., gift to charity, \$5000.
- Thompson, William, New York, gift to Phillips Exeter Academy, \$100,000.
- Throop College of Technology, gift by various donors, \$50,000.
- Thurber, J. B., New York, gift to Yale University, \$10,000.
- Tilton, Caroline S., New Orleans, La., will to charity, \$20,000.
- Tirker, George F., New London, Conn., will to charity, \$5000.
- Tolan, Edwin F., Philadelphia, Pa., will to charity, \$6000.
- Trade school, gift for, by S. Benson, \$100,000.
- Trinity College, will by George F. Newton, \$5000.
- Trinity College, Sioux City, Iowa, gift by various donors, \$7000.
- Tripp, I. S., Prairie du Sac, Wis., will to Carroll College, \$5000; to Ripon College, \$5000; to University of Wisconsin, \$400,000.
- Tucker, A. H., Hyde Park, Mass., will to church, \$6000.
- Tufts College, will by Frederick S. Pearson, \$500,000.
- Turner, Abbie, Randolph, Mass., will to charity, \$27,000.
- Tuskegee Institute, gift by various donors, \$450,000.
- Unemployed Colorado miners, gift by Rockefeller Foundation, \$100,000.
- University museum, gift by Pierre S. Dupont, \$25,000.
- Union Bethel, gift by Mrs. Maunca White, \$22,500.
- Vandens, Maria, Baltimore, Md., will to charity, \$12,000.
- Vanderbilt, Mrs. W. K., New York, gift to Mental Hygiene Institute, \$40,000.
- Vassar College, gift by Mrs. Avery Coonley, \$25,000; gift by Mrs. Ellen Hooker, \$25,000; gift by Rockefeller Foundation, \$200,000; gift by various donors, \$615,000.
- Virginia, University of, gift by John B. Cobb, \$50,000; gift by Mrs. C. H. Schiff, \$50,000; gift by unnamed donor, \$50,000.
- Vowles, Ann, New York, will to church, \$5000.
- Vowless, Ann, Brooklyn, N. Y., will to church, \$7000.
- Wadsworth Athenaeum, gift by Mrs. James J. Goodman, \$50,000.
- Wage dividends by corporations as reported, \$5,000,000.
- Wait, Theodore N., Lyndonville, Vt., gift to Lyndon Institute, \$50,000.
- Walker, E. C., Walkerville, Mich., will to charity, \$20,000; to church, \$30,000; to College of St. Andrew, \$10,025; to Detroit Art Museum, \$25,000.

Ward, Robert B., New Rochelle, N. Y., will to charity, \$1,500,000.
 Warsaw, Ind., gift to church by various donors, \$75,000.
 Washburne College, will by A. C. Stick, \$75,000.
 Washington University, will by Mrs. W. A. McMillan, \$1,000,000; will by Charles E. Slocum, \$10,000.
 Waterman, L. D., Indianapolis, Ind., gift to Indiana University, \$100,000.
 Watson, Mrs. H. W., Doylestown, Pa., will to church, \$100,000.
 Watertown, Mass., gift to college by William P. Herring, \$1,000,000.
 Webb, Edward A., St. Paul, Minn., will to missions, \$400,000.
 Webb, Mrs. M. E., New York, will to charity, \$167,586.
 Wellesley College, gift by Andrew Carnegie, \$95,000.
 Wells, H. P., New York, will to charity, \$50,000.
 Wentworth, Samuel T., Sandwich, N. H., gift of library to town, \$18,000.
 Western Advent Publication Society, will by Charles Eckhart, \$12,500.
 Weston, Edward, New York, gift to Stevens Technical Institute, \$10,000.
 Wharton, Susan F., Philadelphia, Pa., will to charity, \$5000; to Pennsylvania Academy of Fine Arts, \$5000.
 Wherling, Mrs. M. L. L. O., Cincinnati, Ohio, will to Miami University, \$400,000.
 White, A. T., New York, gift to Rensselaer Institute, \$50,000.
 White, Leila M., Bloomington, Ill., will to hospital, \$5000.
 White, Mrs. Maunca, Cincinnati, Ohio, gift to Union Bethel, \$22,500.
 Whitney, Anne, Boston, Mass., will to charity, \$5000.
 Whitney, F. O., Boston, Mass., will to charity, \$5000.
 Widener, Joseph E., Philadelphia, Pa., gift to employees, \$100,000.
 Widener, P. A. B., Philadelphia, Pa., gift to charity, \$10,000.
 Wilcox, George C., Evanston, Ill., will to charity, \$10,000; to church, \$10,000.
 Wilder, George, New York, gift to charity, \$5000.
 Williams, Alice M., Williamsport, Pa., will to charity \$18,000.
 Williams University, will by Mrs. Van Antwerp De Witt Jessup, \$300,000.
 Wilson, Mary A., St. Louis, Mo., will to church, \$21,000.
 Winfield Lutheran College, gift by J. P. Winfield, \$75,000.
 Winston-Salem Academy, gift by various donors, \$300,000.
 Wirt Walker estate, Chicago, Ill., \$50,000.
 Wisconsin, University of, will of I. S. Tripp, \$400,000.
 Wittenberg College, gift by F. E. and P. A. Myers, \$20,000.
 Woeppe, Ignatz, Buffalo, N. Y., will to charity, \$8500.
 Wolf, Celestin, Champaign, Ill., gift to church, \$25,000.
 Wolff, Edwin, New York, will to charity, \$20,000.
 Woman's Club, gift by Julius Rosenwald, \$50,000.
 Woodman, Annie E., Dover, N. H., will for art institute, \$100,000.
 Woodman, Sarah C., Dover, N. H., will to church, \$10,000.
 Woodruff, Frances E., Morristown, N. J., will to city, \$50,000.
 Woodward, R. B., New York, will to Brooklyn Institute of Arts and Sciences, \$160,000.
 Woodworth, Sarah E., Boston, Mass., will to hospital, \$5000.
 Woolverton, William H., New York, will to library at Alexandria, Pa., \$40,000.
 Wright, G. H., New York, will to Knickerbocker Hospital, \$580,000; to public library, \$100,000.
 Wursten, Alfred, Philadelphia, Pa., will to charity, \$20,000.
 Wyman, Cyrus, Langdon, Kan., will to charity, \$200,000.
 Wyman, H. M., estate of, gift to Harvard University, \$75,000.
 Yale Chinese Medical College, gift by Rockefeller Foundation, \$16,200.
 Yale University, gift by Mrs. C. W. Goodyear, \$10,000; gift by Howland family, \$15,000; gift by Mrs. Herbert Sheftel, \$10,000; gift by J. B. Thurber, \$10,000; gift by various donors, \$453,270; will by C. H. Forman, \$510,434; will by J. H. Hotchkiss, \$1,000,000; will by Mrs. Van Antwerp De Witt Jessup, \$800,000; will by Charles H. Pine, \$150,000.
 Y. M. C. A., gift by James A. B. Brunt, \$125,000; gift by Mrs. E. E. Jackson, \$50,000; gift by Galen C.

Moses, \$15,000; gift by J. S. Nicholson, \$10,000; gift by Rockefeller Foundation, \$100,000; will by Grace E. Dodge, \$25,000; will by Albert Keep, \$200,000.
 Y. M. C. A., Allentown, Pa., gift by various donors, \$120,000; Buffalo, N. Y., gift by various donors, \$32,000; Chicago, Ill., gift by unnamed donor, \$20,000; Columbus, O., gift by various donors, \$28,000; Duluth, Minn., gift by J. H. Barnes, \$60,000; Grand Forks, N. Dak., gift by various donors, \$40,000; hotel, Chicago, Ill., gift by various donors, \$685,000; La Porte, Ind., gift by various donors, \$11,896; Muskogee, Okla., gift by various donors, \$75,000; Nashua, N. H., gift by unnamed donor, \$10,000; Paterson, N. J., gift by various donors, \$36,000.
 Y. W. C. A., gift by Lizzie Eckhart, \$10,000; will by Grace Dodge, \$700,000.
 Y. W. C. A., Los Angeles, Cal., gift by various donors, \$88,000; Paterson, N. J., gift by various donors, \$86,000.
 Yunivet, Julia E., New York, will to church, \$6200; will to St. Xavier College, \$5000.
 Zion movement, gift by Nathan Shaun, \$85,000.
 Zionist relief fund, gift by various donors, \$120,000.
 Zurbrugg, T., Philadelphia, Pa., will to hospital, \$250,000.

GIPSY MOTH. See ENTOMOLOGY.

GLASS, MONTAGUE. See LITERATURE, ENGLISH AND AMERICAN, Fiction.

GOETHALS, MAJOR-GENERAL G. W. See PANAMA CANAL.

GOLD. The mined production of gold in the mines of the United States for the calendar year 1914 was 4,484,544 fine ounces, valued at \$92,703,757. This was an increase in value of \$2,715,869 over the production of 1913. The principal gold producing States ranked as follows in 1914: California, Colorado, Alaska, Nevada, South Dakota, Arizona, Montana, Utah, Oregon, Philippines, Idaho, and New Mexico. No other States than these mentioned have produced over \$1,000,000 in the last year. The most notable increases in the gold output in 1914 were \$1,736,189 in Colorado, \$624,479 in Montana, and \$503,152 in the Philippines. The largest decreases were \$313,942 in Nevada, \$299,882 in Utah, \$192,244 in Idaho, and \$139,102 in Washington. The imports of gold in the United States for the calendar year 1914 amounted to \$57,387,741, and the exports to \$222,616,156.

The gold production for 1915 is estimated by the director of the mint. The table given below shows the total mine production of gold in the various States in 1914, and the value of the increase or decrease as compared with 1913.

State or Territory	Quantity	Gold Value	Increase (+) or decrease (—)	
			Gold (value)	
Alabama	579.05	\$11,970	+	\$876
Alaska	762,596.03	15,764,259	+	137,446
Arizona	202,166.62	4,179,155	+	155,244
California	999,112.87	20,653,496	+	246,538
Colorado	961,845.20	19,883,105	+	1,736,189
Georgia	787.06	16,270	+	1,162
Idaho	55,743.24	1,152,315	—	192,244
Illinois				
Maryland and				
Pennsylvania	10.88	225	+	225
Michigan				
Missouri				
Montana	199,203.94	4,117,911	+	624,479
Nevada	555,402.47	11,481,188	—	313,942
New Mexico	56,680.79	1,171,696	+	289,770
North Carolina	6,343.94	131,141	+	4,698
Oklahoma				
Oregon	76,986.92	1,591,461	—	86,249
Philippines	66,347.00	1,371,514	+	503,152
Porto Rico	135.46	2,800	+	1,684
South Carolina	856.04	7,360	+	2,479
South Dakota	854,758.45	7,393,508	+	14,214
Tennessee	299.68	6,194	—	1,401
Texas	11.32	234	—	106
Utah	157,961.16	3,265,347	—	299,882

State or Territory	Gold		Increase (+) or decrease (—)
	Quantity	Value	
Vermont .....	.....	.....	8
Virginia	20.76	429	175
Washington	26,953.24	557,173	139,102
Wisconsin .....	.....	.....	.....
Wyoming	242.17	5,006	19,178
Total	4,484,544.24	\$92,703,757	+\$2,715,869
Increase (+) or decrease (—) in value .....	.....	.....	+\$2,715,869

WORLD PRODUCTION. The world production of gold in 1913-14 is shown in the following table:

WORLD'S PRODUCTION OF GOLD, 1913-1914, BY COUNTRIES		
Country	1913	1914
North America:		
United States	\$88,884,400	\$94,531,800
Canada	16,216,131	15,925,044
Mexico	18,250,000	18,000,000
Cuba	24,600	.....
Africa:	205,875,000	201,000,000
Australasia:	53,038,090	49,386,180
Europe:		
Russia and Finland	24,578,575	26,750,000
Austria-Hungary	2,180,441	1,500,000
Germany	60,000	.....
Norway .....	.....	.....
Sweden	86,630	.....
Italy	30,572	.....
Spain and Portugal	2,500	.....
Turkey	500	.....
France	1,946,600	1,000,000
Great Britain	17,860	.....
Serbia	250,000	100,000
South America:		
Argentina	100,000	.....
Bolivia and Chile	800,000	500,000
Colombia	3,000,000	3,000,000
Ecuador	289,133	.....
Brazil	3,009,786	3,000,000
Venezuela	444,800	.....
Guiana—		
British	1,853,368	1,250,000
Dutch	470,433	500,000
French	3,050,600	3,000,000
Peru	492,200	500,000
Uruguay	111,000	.....
Central America:	3,000,000	3,500,000
Asia:		
Japan	4,470,723	4,476,500
China	3,658,900	3,800,000
Indo-China	70,000	.....
Chosen (Korea)	3,281,333	3,750,000
Siam	56,500	.....
India, British	11,152,463	11,888,870
East Indies, British	1,352,000	.....
East Indies, Dutch	3,387,100	4,750,000
Total	\$454,942,211	\$453,000,000

The gold production of the world in 1915, according to the preliminary estimates made by the *Engineering and Mining Journal*, New York, in its annual review of the year, was greater than for the previous two years, and indicated an excellent showing for the gold mining industry, although it must be considered that the European war did not directly affect any of the great gold mining regions even in Russia. The estimated increase from 1914 was \$19,397,761, the gain being due chiefly to the increased production of the Transvaal and the United States, though as will be seen from the accompanying table, the increase was evident for the more important producing districts except in Australasia and Mexico. The Transvaal in 1915 produced about 40 per cent of the world's total, the United States about 21 per cent, Australasia a little over 9 per cent, and Russia about 6 per

cent, accounting for three-quarters of the world's supply.

GOLD PRODUCTION OF THE WORLD (<i>Engineering and Mining Journal</i> , New York)		
	1914	1915
Transvaal	\$173,176,133	\$188,397,707
Rhodesia	17,745,980	18,852,135
West Africa	8,871,371	8,556,550
Madagascar, etc.	1,980,000	1,865,000
Total Africa	\$201,573,484	\$217,671,392
United States	\$94,531,800	98,891,000
Mexico	18,185,000	16,975,000
Canada	15,925,044	15,875,000
Central America, etc.	8,500,000	3,750,000
Total North America ..	\$132,141,844	\$137,491,100
Russia, inc. Siberia	\$26,763,000	26,750,000
France	1,450,000	1,025,000
Other Europe	2,850,000	1,875,000
Total Europe	\$30,563,000	\$29,650,000
British India	\$12,327,980	11,699,885
British and Dutch E. Indies	4,690,000	4,825,000
Japan and Chosen	7,476,500	7,850,000
China and others	3,625,000	3,675,000
Tl. Asia, not inc. Siberia	\$28,119,480	\$28,049,885
South America	\$13,525,000	13,750,000
Australasia	45,659,271	44,868,018
Total for the world....	\$451,582,129	\$470,979,890

See also METALLURGY.

GOLD COAST. A British crown colony and protectorate, with Ashanti and the Northern Territories, situated on the Gulf of Guinea. Area of the colony, 24,200 square miles; of Ashanti, 20,000; of the Northern Territories, 35,800—total, 80,000. The census (1911) returns place the population for the colony at 853,766; Ashanti, 287,814; Northern Territories, 361,806; but the figures are believed to understate the actual number of inhabitants. Accra, the capital, had (1911) 19,585 inhabitants; Coomassie, 18,853; Cape Coast Castle, 11,364; Secondee, 7725. The chief products and exports (1913) are cacao, £2,489,218; gold and gold dust, £1,656,110; rubber, £87,915; palm kernels, £159,128; palm oil, £65,952; lumber, £366,094; kola nuts, £144,705. Cotton goods, provisions, and wine and spirits are the main imports. Total trade (1913): £4,952,494 imports, £5,427,106 exports. Revenue, £1,301,566; expenditure, £1,363,291. Tonnage entered and cleared, 2,986,553. A railway runs from Secondee to Coomassie, 168 miles. A railway under construction from Accra to Akwapim is open for traffic to a temporary terminus at Mangoase, about 39 miles distant. An extension to Komfrodna was to be completed in 1915. Total telegraph lines, 1492 miles.

GOLF. The names of Jerome D. Travers and Robert A. Gardner stand out in the golfing history of 1915. The former captured the open title at Baltusrol and the latter won the amateur laurels at Detroit. Both are veterans at the game, and it is noteworthy in this regard that the year produced few new players of special merit. The women's championship went to Mrs. Clarence H. Vanderbeck of Philadelphia. The victory of Travers in the open tourney was in the nature of a "come back," as it was figured that the winner of the amateur title on four different occasions had seen his best days as a golfer. As it turned out, however, the only player to give Travers a battle was Tom McNamara, a professional, who covered the 72 holes in 298, or one stroke less than the victor's

total. This marked the second time in 21 years that an amateur was successful in the quest of the open title. The showing of Travers at Baltusrol made him the favorite in the amateur tournament. Francis Ouimet and Charles Evans also had large followings. All three of these were eliminated before the final round, and Gardner emerged the winner through his defeat of John G. Anderson of Mount Vernon, N. Y. Gardner first captured the amateur honors back in 1909. The women's championship tourney narrowed down to a bitter struggle between Mrs. Vanderbeck and Miss Alexa Stirling, the Southern title holder from Atlanta, Ga. Mrs. Vanderbeck won only after the deciding match had been carried to the fourth extra hole. The most promising of the younger players of the year were Philip V. G. Carter of the Nassau Club, F. K. Robeson, a Pawling schoolboy, Jesse Guilford, Archie McIlwaine, Roy D. Webb, Reginald Lewis, Nelson Whitney, and Oswald Kirkby.

The winners of the leading tournaments were: United States Amateur, Robert A. Gardner; United States Open, Jerome D. Travers; United States Women, Mrs. Clarence H. Vanderbeck; Metropolitan Amateur, Walter J. Travis; Metropolitan Open, Gilbert Nicholls; Metropolitan Women, Miss Lillian B. Hyde; Metropolitan Junior, Philip V. G. Carter; Western Amateur, Charles E. Evans, Jr.; Western Open, Thomas L. McNamara; Western Women, Miss Elaine Rosenthal; Western Junior, De Witt C. Balch; Southern Amateur, Charles L. Dexter, Jr.; Southern Women, Miss Alexa Stirling; Panama-Pacific Amateur, Harry K. B. Davis; Panama-Pacific Open, Walter C. Hagen.

In the intercollegiate championships Yale defeated Princeton in the final round by 5 up and 4 to play. The individual winner was F. R. Blossom of Yale, who vanquished G. A. Peacock of Princeton, in the final by 11 up and 9 to play. The Western intercollegiate championship was won by the University of Illinois.

GOODALE, GREENLEAF AUSTIN. An American soldier, died Feb. 17, 1915. He was born in Orrington, Me., in 1839, and was educated in the Eastern Maine Conference Seminary. He enlisted as a private in the sixth Maine infantry in 1861, and served throughout the war. He was mustered out of volunteer service in 1866 with the rank of captain. In the same year he was appointed lieutenant in the United States infantry, and rose through various grades until he became brigadier-general in 1907. He received several brevets for gallant service during the Civil War. From 1868 to 1898 he took part in Indian campaigns. In 1898-1901 he served in the Philippines.

GOODRICH, JOHN ELLSWORTH. An American classical scholar, died Feb. 24, 1915. He was born in Hinsdale, Mass., in 1831 and graduated from the University of Vermont in 1853. He served as chaplain of the first Vermont cavalry in 1864-65. For many years he was principal of academies in Massachusetts, Vermont, and New Hampshire, and from 1868 to 1870 was superintendent of schools in Burlington, Vt. Between 1872 and 1907 he held chairs at the University of Vermont, where he was professor of Latin for 18 years. He was also librarian of the university from 1873 to 1886, and was dean of the department of arts from 1903 to 1907. He contributed to several en-

cyclopedias, and edited the *Vermont Revolutionary Rolls* in 1904.

GORICAR, JOSEPH. See UNITED STATES AND THE WAR.

GÖRZ AND GRADISCA. See AUSTRIA-HUNGARY.

GOULD, ELGIN RALSTON LOVELL. An American public officer and economist, died Aug. 18, 1915. He was born in Oshawa, Ont., in 1860, and graduated from the University of Toronto in 1881. He afterwards studied at Johns Hopkins, taking the degree of Ph.D. in 1886. From 1892-97 he was lecturer at Johns Hopkins, and from 1895-96 professor in the University of Chicago. In 1896 he became president of the City and Suburban Homes Company of New York, and worked on plans to improve the lives and surroundings of wage earners and at the same time provide a profitable commercial investment. In 1901-02 he was a lecturer on political economy in Columbia University. He was appointed city chamberlain of New York in 1902, holding office until 1904. In 1907-08 he was vice chairman of the New York Charter Revision Committee. He was active in financial, philanthropic, and religious affairs, and in reform movements in New York, and was a member of many learned societies. His writings include: *Housing of Working People*; *Popular Control of the Liquor Traffic*; *The Gothenburg System of Liquor Traffic*; and *The Social Condition of Labor*. He also contributed on economic subjects to magazines.

GOURMONT, RÉMY DE. See FRENCH LITERATURE.

GOVERNMENT. See section so entitled under various countries.

GOVERNORS' CONFERENCE. The eighth annual meeting of this body, known also as the "House of Governors," was held in Boston, August 24 to 27. The topics considered were, penology, greater efficiency in State administration, conservation, and the relation of the State to the national defense. Important addresses on these and other subjects were made. The next meeting of the conference will be in Salt Lake City, Utah.

GRAIN. See AGRICULTURE.

GRAND MAL. See EPILEPSY.

GRANT, ROBERT. See LITERATURE, ENGLISH AND AMERICAN, *Fiction*.

GRAPES. See HORTICULTURE.

GRAPHITE. The total production of graphite in 1914 was 4336 short tons, valued at \$324,118. Of this 1725 was amorphous, and 5,220,539 pounds were crystalline. The greater part of the latter is produced in New York, Pennsylvania, and Alabama. The imports of graphite during the year were 22,002 short tons, valued at \$1,398,261. The largest amount came from Ceylon. Japan and Mexico furnished also large quantities.

GRAY, JOHN CLINTON. An American jurist, died June 28, 1915. He was born in New York City in 1843, and studied at the University of Berlin in 1860-61. In the latter year he entered the Harvard Law School, graduating in 1864. He afterwards took a course in law at New York University. After practicing for several years in Boston he removed to New York, where he became one of the most prominent lawyers. He was appointed judge of the Court of Appeals by Governor Hill in 1888, and in November of that year was elected to a full

term of 14 years. He wrote opinions in several of the most important cases tried in New York City during his term on the bench. He was reelected in 1902, but retired in 1913.

GREAT BRITAIN. THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND. A constitutional monarchy. Capital, London. Great Britain consists of England, Scotland, and Wales. The term "Great Britain," however, is often used to mean "United Kingdom." Attached to the United Kingdom, but not properly a part of it, are the Isle of Man and the Channel Islands.

AREA AND POPULATION. The area of the United Kingdom, including inland water, is stated at 121,331 square miles; including the Isle of Man and the Channel Islands, 121,633 square miles, an area less than that of New England, New York, and New Jersey (123,852 square miles). England and Wales, which are often regarded as a unit, comprise 58,340 square miles, or in land area alone 58,029 square miles; Scotland, 30,405 square miles, or in land area 29,796 square miles. By divisions the area, the population according to the censuses of April 1, 1901, and April 3, 1911, and the density per square mile in 1911, are shown in the following table:

	<i>Sq. M.</i>	<i>Pop. 1901</i>	<i>Pop. 1911</i>	<i>Dens.</i>
England *	50,874	30,813,043	34,045,290	669
Wales	7,466	1,714,800	2,025,202	271
Scotland	30,405	4,472,108	4,760,904	156
Ireland	32,586	4,458,775	4,890,219	135
U. Kingdom	121,331	41,458,721	45,221,615	373
Isle of Man	227	54,752	52,016	229
Channel Isles	75	95,618	96,899	1,292
Total	121,633	41,609,091	45,870,530	374

* Including Monmouthshire.

The population figures represent persons present; no census of the resident, or legal, population is taken in the United Kingdom, and therefore the figures above do not include British soldiers, sailors, and merchant seamen abroad.

The estimated population of the United Kingdom, June 30, 1913, was 46,026,483; June 30, 1914, 46,407,037 (England and Wales, 37,302,983; Scotland, 4,728,500; Ireland, 4,375,554). The population of Great Britain and Ireland was, at different periods, as follows:

	<i>E. & W.</i>	<i>Scot.</i>	<i>Ire.</i>	<i>U. K.</i>
1841	15,914,148	2,620,184	8,196,597	26,730,929
1871	22,712,266	3,360,018	5,412,377	31,484,661
1881	25,974,439	3,735,578	5,174,836	34,884,848
1891	29,002,525	4,025,647	4,704,750	37,732,922
1901	32,527,843	4,472,108	4,458,775	41,458,721
1911	36,070,492	4,760,904	4,890,219	45,221,615

The following table shows the percentage of population in the several divisions and, in the last two columns, the percentage of increase in the decennial periods 1891-1901 and 1901-11:

	<i>1841</i>	<i>1891</i>	<i>1901</i>	<i>1911</i>	<i>'91-'01</i>	<i>'01-'11</i>
England	56.1	72.8	74.3	75.8	12.1	10.5
Wales	3.4	4.0	4.1	4.5	13.3	18.1
Scotland	9.8	10.7	10.8	10.5	11.1	6.4
Ireland	30.7	12.5	10.8	9.7	*5.2	*1.7

* Decrease.

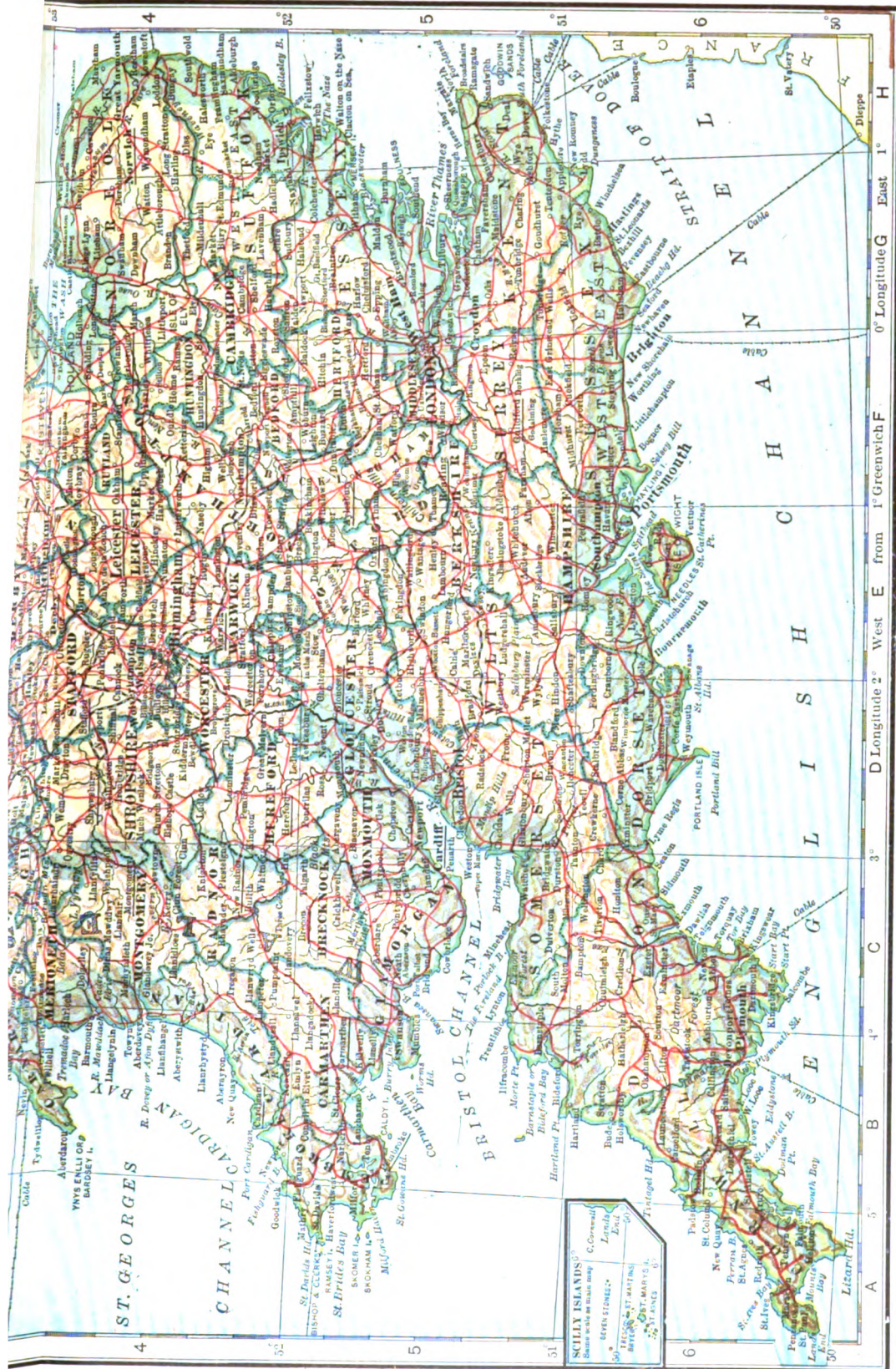
In England and Wales, the increase per cent by births in the period 1901-11 was 28.56; decrease by deaths, 16.13; natural increase, 12.43.

The actual increase per cent was 10.89, the difference between actual increase and natural increase being accounted for by excess of emigrants over immigrants.

In 1911 the number of males and females were, respectively: England, 16,421,298 and 17,623,992 (or 1073 females to 1000 males); Wales, 1,024,310 and 1,000,892 (977 females to 1000 males); Scotland, 2,308,839 and 2,452,065; Ireland, 2,192,048 and 2,198,171.

In England and Wales, the population of urban districts in 1901 numbered 25,058,355, and of rural districts 7,469,488; in 1911, 28,162,936 and 7,907,556. In 1851 the percentage of population in urban districts in England and Wales was approximately 50.2; in 1881 the actual percentage was 67.9; in 1891, 72.0; in 1901, 77.0; in 1911, 78.1. While the general increase per cent in England and Wales was 10.89 in the period 1901-11, the urban increase was 11.1 and the rural 10.2; in the period 1891-1901, the urban increase was 15.2 per cent, and the rural 2.9 per cent. England and Wales had at the 1911 census, 97 urban districts (including the administrative county of London as one district) with a population exceeding 50,000 each. The inhabitants of these districts in 1891 numbered 13,779,848; in 1901, 15,886,874; in 1911, 17,251,009; the increase per cent in the first period being 15.3, and in the second 8.3. London (that is, the administrative county, embracing 74,816 acres, or 117 square miles) had, in 1911, 4,521,685 inhabitants, as compared with 4,536,267 in 1901, or a decrease of 0.3 per cent. The term, "Greater London," is used to describe the area covered by the Metropolitan and City of London police districts; this area embraces, besides the administrative county of London, a wide belt of suburban towns and districts, known as the "outer ring." The outer ring had in 1901, 1,405,852 inhabitants; in 1911, 2,729,673. The area of the outer ring is 368,608 acres, or 576 square miles. Greater London embraced 443,424 acres, or 693 square miles, with 7,251,358 inhabitants in 1911, as compared with 6,581,402 in 1901 and 5,633,806 in 1891; the increase from 1891 to 1901 being 16.8 per cent, and from 1901 to 1911 10.2 per cent. In 1911 the population of the larger cities of England and Wales, after London, with percentage of increase of 1901, was as follows: Birmingham, 525,833 (0.5)—with districts annexed Nov. 9, 1911, 840,202; Liverpool, 746,421 (6.0); Manchester, 714,333 (10.8); Sheffield, 454,632 (11.1)—with districts annexed April 1, 1912, 459,916; Leeds, 445,550 (3.9); Bristol, 357,048 (5.3); West Ham (in the outer ring), 289,030 (8.1); Bradford, 288,458 (3.1); Kingston-upon-Hull, 277,991 (15.7); Newcastle-upon-Tyne, 266,603 (7.9); Nottingham, 259,904 (8.4); Stoke-on-Trent, 234,534 (9.2); Salford, 231,357 (4.7); Portsmouth, 231,141 (22.3); Leicester, 227,222 (7.4); Cardiff (in Wales), 182,259 (10.9); Bolton, 180,851 (7.5); Croydon (in the outer ring), 169,551 (26.6); Willesden (in the outer ring), 154,214 (34.3); Rhondda (in Wales), 152,781 (34.3); Sunderland, 151,159 (3.5).

A large part of the population increase in Scotland from 1901 to 1911 was in the suburbs of Glasgow. The larger municipal boroughs, with 1911 population and increase per cent over 1901, are: Glasgow, 784,455 (1.1); Edinburgh, 320,315 (0.9); Dundee, 165,006 (1.2)—in 1913, Broughty Ferry, which had 11,058 inhabitants



SOLLY ISLANDS	
Some with a main map	C. Crowell
GREEN TIDEWATER	Light
RED TIDEWATER	Light
ST. MARY'S	Light
ST. PETER'S	Light

in 1911, was annexed to Dundee; Aberdeen, 163,331 (6.2); Govan, 89,725 (9.2); Paisley, 84,447 (6.4); Leith, 80,489 (3.9); Greenock, 75,140 (9.0); Partick, 66,848 (23.1); Coatbridge, 43,287 (17.0); Motherwell, 40,378 (29.6).

In Ireland, the population decreased between 1901 and 1911 in all counties except Dublin, Down, Kildare, and Antrim, where the increases were 6.4, 5.2, 4.6, and 3.7 per cent respectively. Dublin had in 1911 304,802 inhabitants; with suburbs, 403,030 (increase 7.4 per cent). Population of Belfast in 1911, 386,947; Cork, 76,673; Londonderry, 40,780; Limerick, 38,518; Waterford, 27,464.

The rate, per thousand inhabitants, of births, of deaths, and of marriages (that is, persons married), is shown in the following table:

		<i>E. & W.</i>	<i>Scot.</i>	<i>Irs.</i>	<i>U. K.</i>
Births	1900.....	28.7	29.6	22.7	28.2
	1905.....	27.8	28.6	28.4	27.1
	1910.....	25.1	26.2	23.8	25.0
	1912.....	23.8	25.9	28.0	24.0
	1913.....	23.9	25.5	22.9	23.9
Deaths	1900.....	18.2	18.5	19.6	18.4
	1905.....	15.3	16.2	17.1	15.6
	1910.....	13.5	15.3	17.1	14.0
	1912.....	13.3	15.3	16.5	13.8
	1913.....	13.7	15.5	17.1	14.2
Marriages	1900.....	16.0	14.6	9.5	15.1
	1905.....	15.3	13.6	10.5	14.7
	1910.....	15.0	13.0	10.1	14.3
	1912.....	15.5	13.7	10.6	14.8
	1913.....	15.5	14.3	10.2	14.9

Number of passengers that arrived in or left the United Kingdom from or for countries out of Europe, distinguishing British and aliens (the last column shows the number of British passengers from and to the United States):

		<i>British</i>	<i>Aliens</i>	<i>Total</i>	<i>U. S.</i>
Arrivals	1900....	97,637	74,681	175,747	54,819
	1905....	122,712	77,908	205,193	61,373
	1910....	397,848	221,011	618,859	132,192
	1912....	199,181	141,515	340,696	71,493
	1913....	227,643	144,975	372,618	77,014
Departures	1900....	168,825	124,722	298,561	102,797
	1905....	262,077	188,422	459,662	122,370
	1910....	397,848	221,011	618,859	132,192
	1912....	467,666	189,169	656,835	117,310
	1913....	469,640	232,051	701,691	129,169

PUBLIC EDUCATION. The educational system in the United Kingdom is partly under state and local control and partly private. Elementary education is compulsory between the ages of 5 and 14, and is provided free by the local authorities aided by state grants. Secondary education is still largely of a private character, but considerable progress has been made in the organization of a secondary-school system. The schools here treated are not to be confounded with the many private, and often expensive, institutions known as "the public schools."

In England and Wales, on July 31, 1913, accommodations in the ordinary public elementary schools numbered 6,940,196, with average attendance of 88.73 per cent (6,862,876 and 88.79 per cent in 1912). At evening and similar schools, there were 798,881 pupils enrolled (784,984 in 1912). In the training colleges and hostels there were 1976 male and 3665 female students. The so-called higher elementary schools numbered 52, with accommodations for 14,810 pupils.

In Scotland, for the year ended Aug. 31, 1913, there were 3177 primary schools in receipt of grants, accommodations for 1,052,659 pupils, 816,055 enrolled, and 729,089 in average attendance (3164 schools, 1,042,703 accommodations, 820,171 enrolled, 733,792 average attendance in 1912). Attendance at continuation classes was 143,942 in 1913 (144,815 in 1912). Higher grade schools in 1912 and 1913 respectively, 194 and 193; accommodations, 41,166 and 40,922; enrollment, 24,544 and 25,372; average attendance, 24,201 and 24,817. In the training colleges and centres there were in 1913, 508 male and 1876 female students.

In Ireland, primary schools at the end of 1913 numbered 8299 (8255 at the end of 1912); school accommodations, 771,974 (769,697); pupils enrolled, 682,011 (668,974); average attendance, 502,622 (499,038). In the training colleges there were 467 male and 725 female students.

AGRICULTURE. The area, including rivers and lakes, but not including foreshore and tidal waters, of the United Kingdom, with the Isle of Man and the Channel Islands, is stated at 77,716,633 acres. The acreage for Great Britain is returned at 56,799,635 and Ireland 20,731,244. The cultivated area, as reported for the first week of June, 1913, was 46,740,904 acres, of which 31,927,301 in Great Britain and 14,691,147 in Ireland. The area under principal crops in 1913, including that in the Isle of Man and the Channel Islands, and the production in 1912 and 1913, were as follows:

	<i>Acres</i>	<i>Bushels</i>	<i>Bushels</i>
	<i>1913</i>	<i>1913</i>	<i>1913</i>
Corn crops:			
Wheat	1,791,569	57,402,802	56,696,400
Barley	1,822,321	58,207,198	65,682,531
Oats	3,983,488	164,800,683	165,282,235
Rye	63,556	.....	.....
Beans	275,626	7,784,045	7,602,475
Peas	165,121	3,924,494	3,885,877
Total	8,211,641	.....	.....
Other crops:			
	<i>Tons</i>	<i>Tons</i>	<i>Tons</i>
Potatoes	1,184,857	5,726,842	7,604,804
Turnips	1,770,079	24,061,857	25,319,517
Mangold	501,033	10,137,766	9,276,129
Hay	9,845,011	14,024,222	14,507,169
Hops	35,676	*373,438	*255,641

* Cwts.

Acreages for 1914 and (subject to revision) for 1915 are reported as follows: wheat, 1,904,930 and 2,334,090; barley, 1,871,170 and 1,523,980; oats, 3,877,960 and 4,148,050; potatoes, 1,197,010 and 1,202,520; turnips, 1,752,570 and 1,617,460; mangold, 515,860 and 500,490. See also AGRICULTURE.

The following table shows the number of live stock in the first week of June for four years. The figures for horses include only those used for agriculture, unbroken horses, and brood mares:

	<i>1912</i>	<i>1913</i>	<i>1914</i>	<i>1915</i>
Horses ..	1,994,607	1,874,264	1,842,560	1,699,640
Cattle ..	11,914,635	11,936,600	12,144,560	12,131,370
Sheep ..	28,967,495	27,629,206	27,886,090	28,181,540
Swine ..	3,992,549	3,305,771	3,939,890	3,783,780

MINING AND METALS. The total value of the minerals raised in 1912 was £131,220,853, and in 1913 £160,112,607. In the latter year, the spot value of the minerals raised in England

was £109,443,999, Wales £27,982,687, Scotland £22,436,444, Ireland £229,209, and the Isle of Man £20,268. By far the most important mineral is coal, and the most important metal, iron. The following table shows the amount in tons of coal produced in the United Kingdom and its spot value in pounds sterling, and the amount and value of pig iron produced, distinguishing the pig iron produced from British and from foreign ores:

		Coal	Pig iron	
			British	Foreign
1900	 tons	225,181,800	4,666,942	4,292,749
	 £	121,652,596	19,596,910	18,025,639
1905	 tons	236,128,936	4,760,187	4,847,899
	 £	82,088,553	14,992,368	15,268,619
1910	 tons	264,433,028	4,975,735	5,036,363
	 £	108,377,567	17,008,812	17,216,059
1911	 tons	271,891,899	5,020,510	4,505,762
	 £	110,783,682	16,146,340	14,490,872
1912	 tons	260,416,338	4,451,636	4,299,828
	 £	117,921,123	16,419,298	15,859,372
1913	 tons	287,480,473	.....	.....
	 £	145,535,669	.....	.....

In 1914 the coal output amounted to 253,195,000 tons. The value of metals, aside from iron, produced from British ores in 1912 was as follows: white tin, £1,116,738; lead, £349,561; zinc, £158,622; fine copper, £22,714; silver, £14,382; gold, £5103.

FISHERIES. Wet fish (exclusive of salmon and shell fish) landed on the coasts of the United Kingdom in 1912 amounted to 24,092,862 cwts.; in 1913, 24,657,116 cwts. The values are stated at £12,779,717 and £14,229,311 respectively. The herring catch in 1913 was valued at £4,572,295; cod, £2,300,119; hake, £678,981; soles, £474,127. The value of shell fish landed in 1912 was £454,709, and in 1913 £463,642.

COMMERCE. Returns of trade shown below

for the year 1914 are subject to slight revision. Total imports, imports reexported, and net imports (that is, imports for home consumption) have been valued as follows (exclusive of specie and bullion, of foreign merchandise transhipped under bond, and of diamonds from the Union of South Africa):

	Total imports	Reexports	Net imports
1905	 £2565,019,917	£ 77,779,913	£2487,240,004
1910	 678,257,024	103,761,045	574,495,979
1912	 744,640,631	111,737,691	632,902,940
1913	 768,734,739	109,575,037	659,159,702
1914	 697,432,649	95,489,586	601,943,063

In 1910 imports of gold and silver specie and bullion amounted to £71,422,077; in 1912, £69,467,185; in 1913, £74,028,598; in 1914, £62,596,632. Total exports, reexports of foreign and colonial produce, and domestic exports (that is, exports of British produce) have been valued as follows (exclusive of specie and bullion and of foreign merchandise transhipped under bond):

	Total exports	Reexports	Dom. exp.
1905	 £2407,596,527	£77,779,913	£2329,816,614
1910	 534,145,817	103,761,045	430,384,772
1912	 598,961,130	111,737,691	487,223,439
1913	 634,820,326	109,575,037	525,245,289
1914	 525,720,311	95,489,586	430,230,725

Exports of gold and silver specie and bullion in 1910 amounted to £64,724,213; in 1912, £64,871,488; in 1913, £62,142,038; in 1914, £41,488,125.

Total imports of merchandise, domestic exports of merchandise, and foreign and colonial exports of merchandise in 1913 and 1914 are shown by classes in the following table, in thousands of pounds sterling (figures for 1914 subject to revision):

	Total Imports		Dom. Exports		Foreign and Colonial Exports	
	1913	1914	1913	1914	1913	1914
I. Food, drink, and tobacco:						
Grain and flour	85,495	79,685	3,562	3,101	1,655	2,577
Meat, including animals for food	56,726	63,101	1,239	1,140	2,180	2,791
Other food and drink	.....	.....	24,411	18,988	.....	.....
1. Non-dutiable	81,265	78,513	.....	.....	5,630	4,478
2. Dutiable	58,683	69,150	.....	.....	6,262	7,324
Tobacco	8,003	7,491	8,376	8,707	265	276
Total	290,202	297,940	32,588	26,936	15,942	17,446
II. Raw materials and articles mainly unmanufactured:						
Coal, coke, and manufactured fuel	37	41	53,660	42,201	8	1
Iron ore, scrap iron, and steel	7,433	5,488	411	299	9	12
Other metallic ores	10,197	9,528	130	109	564	417
Wood and timber	33,789	25,337	341	277	838	675
Raw cotton	70,571	55,346	.....	.....	9,143	7,856
Wool, including rags, etc.	37,736	34,216	4,624	4,449	13,574	13,718
Other textile materials	19,751	15,867	434	421	5,279	3,655
Oil seeds, nuts, oils, fats, and gums	41,577	41,376	4,468	3,973	5,670	5,644
Hides and undressed skins	15,067	12,719	1,886	1,478	8,411	6,034
Materials for paper making	5,816	5,958	958	845	298	176
Miscellaneous	39,849	31,095	2,998	2,650	20,254	16,179
Total	281,823	236,471	69,905	56,711	64,038	53,867
III. Articles wholly or mainly manufactured:						
Iron and steel and manufactures thereof	15,282	10,865	54,292	41,719	321	256
Cutlery, hardware, implements, and instruments	7,378	5,197	7,972	6,503	1,541	1,022
Electrical goods and apparatus	1,587	1,242	5,386	3,018	239	186
Machinery	7,283	6,704	37,013	31,335	1,307	1,053
Ships and boats (new)	34	32	11,026	6,825	5	1
Manufactures of wood and timber, including furniture	3,583	2,337	2,042	1,565	589	320
Yarns and textile fabrics:						
1. Cotton	12,250	9,367	127,162	103,275	2,238	1,798
2. Wool	10,491	7,647	37,677	31,543	1,233	1,152
3. Silk	15,115	13,391	2,158	1,866	1,768	2,126
4. Other materials	9,129	7,358	14,828	12,984	2,377	2,111

	<i>Total Imports</i>		<i>Dom. Exports</i>		<i>Foreign and Colonial Exports</i>	
	1913	1914	1913	1914	1913	1914
Apparel, including boots, shoes, and hats	5,980	4,257	16,424	14,540	842	606
Chemicals, drugs, dyes, and colors	12,906	12,037	21,974	19,530	1,641	1,600
Leather and mfrs., excl. boots and shoes	13,431	13,454	5,648	4,685	2,895	1,828
Earthenware and glass	4,546	2,988	5,213	4,149	196	135
Paper and manufactures thereof	7,674	6,788	3,679	3,189	276	209
Railway carriages and trucks (not of iron), motor cars, cycles, carts, etc.	8,357	7,267	11,866	10,740	942	981
Miscellaneous	26,524	19,862	84,229	30,408	3,191	2,481
Total	193,602	160,378	411,368	338,152	29,458	24,092
IV. Miscellaneous and Unclassified †	8,108	2,644	11,384	8,432	137	85
Grand total	768,735	697,433	525,245	430,231	109,575	95,490

* Other than machinery and telegraph and telephone wire. † Including parcel-post goods not liable to duty.

Some of the principal articles of import not shown separately in the table were valued as follows in 1913 and 1914, in thousands of pounds sterling: Wheat, 43,849 and 44,741; sugar, 23,067 and 32,988; butter, 24,084 and 24,013; beef, 18,874 and 23,265; bacon, 17,429 and 18,226; fruits, 15,886 and 16,000; maize, 13,770 and 11,763; mutton, 11,112 and 11,595; tea, 13,783 and 14,337. The domestic exports of cotton piece goods in 1913 was 97,776 thousand pounds sterling, and in 1914, 79,183; cotton yarn, 15,006 and 11,973; other cotton manufactures, 12,819 and 11,137; woolen tissues, 14,467 and 11,598; worsted tissues, 6186 and 6205; linen piece goods, 5969 and 5481.

The table below shows the total imports consigned to and the total exports consigned from the principal countries, in thousands of pounds sterling:

	<i>Imports</i>		<i>Exports</i>	
	1912	1913	1912	1913
United States	134,579	141,652	64,637	59,458
Germany	70,048	80,411	59,572	60,500
British India	52,149	48,420	59,775	71,670
France	45,505	46,353	37,532	40,882
Argentina	40,808	42,485	21,325	23,437
Russia	40,589	40,271	21,786	27,694
Canada	26,881	30,488	27,320	27,307
Australia	36,112	38,065	38,281	37,829
Belgium	23,616	23,382	19,556	20,660
Denmark	22,306	24,029	6,171	6,589
Netherlands	21,434	23,578	19,364	20,522
Egypt	25,790	21,395	9,597	9,964
New Zealand	20,302	20,338	11,186	11,790
Spain	14,552	14,394	7,678	8,631
Sweden	13,236	14,213	8,104	9,235
Switzerland	10,627	11,070	4,758	5,088
Italy	8,239	8,127	15,011	15,622
Austria-Hungary	7,019	7,706	6,153	5,780
Straits Settlements*	18,239	19,373	5,156	7,388
U. of S. Africa †	11,276	12,301	23,280	24,346
Japan †	3,933	4,888	12,471	14,827
China	4,933	4,672	10,889	15,010
Brazil	9,360	10,008	13,172	13,021

Total, including others 744,640 768,735 598,961 634,820

* Including Federated Malay States. † Imports do not include diamonds. ‡ Including Formosa.

SHIPPING. The total net tonnage (exclusive of the coasting trade) entered at the ports, with cargo and in ballast, was 76,190,616 in 1912 and 82,148,569 in 1913; cleared, 76,266,429 and 82,661,012. The British tonnage entered in 1912 was 44,291,842, and in 1913, 46,602,920; German, 7,761,144 and 9,073,855; Norwegian, 5,523,796 and 5,883,316; Swedish, 2,991,136 and 3,400,660; Dutch, 3,027,243 and 3,169,375; Danish, 2,987,971 and 3,149,675; French, 1,888,246 and 2,248,981. In 1913, the British merchant marine consisted of 12,602 steamers, of 18,683,039 tons gross, and 8336 sail, of 846,504 tons gross; total,

20,938 vessels, of 19,529,543 tons gross. In 1913, 909 steamers, of 1,170,107 tons net, and 338 sail, of 30,382 tons net, were built in the United Kingdom, exclusive of warships; the warship tonnage built was 193,785 for the British navy and 55,024 for the navies of other countries.

COMMUNICATIONS. The length of railway open to traffic in the United Kingdom on Dec. 31, 1914, was 23,701 miles, as compared with 23,691 miles at the end of 1913, and 23,205 at the end of 1912. The paid-up capital, Dec. 31, 1914, was £1,421,848,000; total receipts during the year, £139,098,000; working expenses, £88,173,000; net receipts, £50,925,000 (£52,011,000 in 1913). The length of tramway and light railway at the end of 1913 was 2675 miles; paid-up capital, £77,198,680; net receipts, £5,588,121.

A summary for the year 1914, with comparative figures for 1913, was issued during the year by the commercial department of the British board of trade and gave the following statistics of the railways of the United Kingdom, for the calendar year 1914, with comparative figures for the previous year. It was stated that on account of the war no further statistics for the year would be published.

<i>Mileage of Lines Open for Traffic.</i>	<i>1914</i>		<i>1913</i>	
	<i>Miles</i>	<i>Miles</i>	<i>Miles</i>	<i>Miles</i>
Running Lines:				
First track	23,701	23,691		
Second track	13,403	13,392		
Third track	1,648	1,619		
Fourth track	1,277	1,254		
Over four tracks reduced to single track	708	700		
Sidings reduced to single track	14,928	14,749		
Total of single track, including sidings	55,663	55,405		

Authorized Capital:		
Shares and stock	\$5,046,116,500	†\$4,885,481,250
Loans and debenture stocks	1,989,110,520	1,979,521,740
Total	\$7,035,227,020	\$6,865,002,990

Paid-up Capital. (The figures preceded by * show the nominal additions to capital included in the figures above.)		
Ordinary	\$2,399,824,260	\$2,396,291,040
	* 453,520,620	* 451,134,860
Preferential	173,990,430	1,724,308,560
	* 213,703,920	* 213,752,520
Guaranteed	604,263,240	604,268,100
	* 84,384,180	* 84,384,180
Loans	62,810,640	58,820,580
Debenture stock	1,711,536,480	1,699,605,180
	* 216,517,860	* 216,513,000
Total	\$6,518,338,920	\$6,488,293,460
	* 968,026,580	* 965,784,060

Revenue Receipts and
Expenditure:

Total receipts (including miscellaneous net receipts).....	\$676,016,280	\$677,781,860
Expenditure	428,520,780	424,375,200
Net income	\$247,495,500	\$253,356,660

† Including nominal additions to the amount of \$142,470,900 which were excluded from the total for 1913.
‡ Including the estimated amount receivable by the companies, under agreement with the government, in respect of the control of British railways during the period from August 5 to December 31.

According to the railway returns for 1913, there were on December 31st of that year 12,118 tender engines, 8697 tank engines, and 12,315 tenders on the railways of England and Wales; 2043 tender engines, 806 tank engines, and 2049 tenders in Scotland, and 631 tender engines, 340 tank engines, and 607 tenders in Ireland.

The first application in the British Isles of electric locomotives for heavy goods traffic was inaugurated on the North-Eastern Railway on the electrified section from Shildon to Newport. This electrified line has no steep grades, and the traffic consists of heavy freight for the blast furnaces at Erimus sidings, Newport, near Middlesborough. An overhead system is employed with two bow collectors on each locomotive. There were 10 locomotives, which are eight-wheeled, with a motor driving each axle, and capable of hauling a load of 1000 tons. The power is supplied at 1500 volts to the overhead conductors, which will be about 17½ feet above rail level. The first section of the London and South-Western Railway's newly electrified lines from Waterloo Station, in London, to Wimbledon (through East Putney), was opened for traffic on Oct. 25, 1915, while the second portion of the electrified system, which includes Waterloo, Barnes, Richmond, Kingston, Wimbledon, Clapham Junction, Waterloo, was nearly ready for operation at that time. Up to Aug. 31, 1915, 92,658 employees of the railways of the United Kingdom had enlisted in the British army, this being not less than 14.9 per cent of the total 621,588 men who were employed at the beginning of the war.

On March 31, 1913, there were 75,042 miles of state telegraph and telephone line, with 2,661,378 miles of wire. Post offices, March 31, 1914, 24,447.

FINANCE. The monetary unit is the pound sterling, whose par value is \$4.86656. Ordinary revenue (actual receipts into the exchequer) and ordinary expenditure (actual issues out of the exchequer chargeable against revenue) have been as follows, in years ended March 31st: in 1900, £129,804,566 and £143,687,068; in 1905, £153,182,782 and £151,768,875; in 1910, £131,696,456 and £157,944,611; in 1912, £185,090,286 and £178,545,100; in 1913, £188,801,999 and £188,621,930; in 1914, £198,242,897 and £197,492,969. The table below shows receipts into the exchequer, under the principal heads thereof, in the fiscal years 1913 and 1914:

Revenue	1912-13	1913-14
Customs	£ 33,485,000	£ 35,540,000
Excise	88,000,000	89,590,000
Estate, etc., duties.....	25,248,000	27,359,000
Stamps *	10,059,000	9,966,000
Land tax	700,000	700,000
House duty	2,000,000	2,000,000

Revenue	1912-13	1913-14
Property and income tax.....	44,806,000	47,249,000
Land value duties.....	455,000	715,000
Tax revenue	£154,758,000	£163,029,000
Postal service.....	£ 20,300,000	£ 21,190,000
Telegraph service	3,100,000	3,080,000
Telephone service	5,755,000	6,530,000
Crown lands (net).....	580,000	530,000
Receipts from Suez Canal shares and sundry loans	1,418,900	1,579,972
Fee and patent stamps...	1,066,000	1,078,000
Receipts by civil departments, etc.	1,859,099	1,225,925
Total revenue	£188,801,999	£198,242,897
* Exclusive of fee and patent stamps.		

Receipts into the exchequer in 1914-15 and the estimates for 1915-16 are as follows:

Revenue	1914-15	1915-16
Customs	£ 38,662,000	£ 38,950,000
Excise	42,313,000	56,250,000
Estate, etc., duties.....	28,382,000	28,000,000
Stamps *	7,577,000	6,500,000
Land tax	630,000	860,000
House duty	1,930,000	1,990,000
Property and income tax.....	69,399,000	103,000,000
Land value duties.....	412,000	350,000
Tax revenue	£189,305,000	£235,700,000
Postal service	£ 20,400,000	£ 20,600,000
Telegraph service	3,000,000	3,100,000
Telephone service	6,250,000	6,700,000
Crown lands (net).....	545,000	530,000
Receipts from Suez Canal shares and sundry loans	1,277,000	2,002,000
Miscellaneous	5,917,000	1,700,000
Total non-tax revenue.....	£ 37,389,000	£ 34,632,000
Total revenue	£226,694,000	£270,332,000
* Exclusive of fee and patent stamps.		

Issues out of the exchequer in the years 1913-14 and 1914-15 are reported as follows:

Expenditure	1913-14	1914-15
National debt services....	£ 24,500,000	£ 23,500,000
Road improvement fund.....	1,394,951	1,545,000
Payments to local taxation accounts, etc.	9,734,128	9,885,000
Other consolidated fund services	1,693,890	1,706,000
Army	28,346,000	28,885,000
Navy	48,833,000	51,550,000
Civil services *	53,901,000	58,885,000
Revenue departments	4,483,000	4,741,000
Postal service	24,607,000	26,227,000
Total expenditure	£197,492,969	£206,924,000
Expenditure against capital	4,220,749	5,265,000

* Including expenditure on education, science, and art (£19,450,000 in 1913-14) and old-age pensions, etc. (£19,666,000 in 1913-14).

It will be seen that in 1914-15 the issues out of the exchequer, £206,924,000, aggregated less than the revenue, £226,694,000; but between the outbreak of the war in August, 1914, and the end of the fiscal year, Mar. 31, 1915, votes of credit were taken amounting to £362,000,000. The war budget submitted by the chancellor of the exchequer on Sept. 21, 1915, shows estimated revenue for the fiscal year 1916 amounting to £272,000,000, a sum a little larger than the total given in the table above. The expenditure was estimated at £1,590,000,000, the estimated deficit being £1,318,000,000. See paragraph *The Budget* under section *History*.

On Nov. 15, 1915, the prime minister moved a vote of credit for £400,000,000, this amount rais-

ing the total of the five votes taken up to that time during the fiscal year (that is, since April 1st) to £1,300,000,000. Add to this sum the total of the votes of credit between August, 1914, and March 31, 1915, and the total votes of credit during the war up to Nov. 15, 1915, are seen to be £1,662,000,000. And the fiscal vote of credit was expected to carry the war only to the middle of February, 1916.

The nominal amount of the funded debt on March 31, 1914, was £586,717,872; estimated capital liability in respect of terminable amenities, £29,552,219; unfunded debt, £35,000,000 (including treasury bills temporarily paid off, but renewable not later than June 30); total "dead-weight" debt, £651,270,091. The net increase of the debt during 1914-15 was £457,546,985, so that on March 31, 1915, the "dead-weight" debt was £1,108,816,076. And it was expected that a sum about double this amount would represent the "dead-weight" debt on March 31, 1916.

ARMY. See MILITARY PROGRESS, *passim*.

NAVY. Additions to the navy since the beginning of the war in August, 1914, cannot be stated. The following statement issued by the Office of Naval Intelligence at Washington relates to July 1, 1914. Number and displacement of warships of 1500 or more tons, and of torpedo craft of 50 or more tons, built and building: Dreadnoughts (battleships having a main battery of all big guns, that is, 11 or more inches in calibre): built, 20, of 423,350 tons; building, 16, of 421,750 tons. Pre-dreadnoughts (battleships of about 10,000 or more tons, whose main batteries are of more than one calibre): built, 40, of 589,385 tons; building, none. Coast-defense vessels (smaller battleships and monitors), none built or building. Battle cruisers (armored cruisers having guns of largest calibre in main battery and capable of taking a place in line of battle with the battleships): built, 9, of 187,800 tons; building, 1, of 28,500 tons. Armored cruisers: built, 34, of 406,800 tons; building, none. Cruisers (unarmored warships of 1500 or more tons): built, 74, of 382,815 tons; building, 17, of 67,000 tons. Torpedo-boat destroyers: built, 167, of 125,850 tons; building, 21, of 21,770 tons. Torpedo boats: built, 49, of 11,488 tons; building, none. Submarines: built, 75, of 30,362 tons; building, 22, of 17,236 tons. Total tonnage: built 2,157,850; building, 556,256. Excluded from the foregoing: ships over 20 years old from date of launch unless reconstructed and rearmed within five years; torpedo craft over 15 years old; ships not actually begun or ordered although authorized; transports, colliers, repair ships, torpedo-depot ships, and other auxiliaries. The active personnel, July 1, 1914, was reported at 150,609 officers and men. See also NAVAL PROGRESS.

GOVERNMENT. The executive authority is vested in the King, acting through his ministers. The legislative power devolves upon the Parliament, which consists of the House of Lords and the House of Commons. The peers entitled to sit in the House of Lords in 1915 numbered 654, including the lords spiritual and temporal, and three princes of the blood royal. The second Parliament of George V, which convened Jan. 31, 1911, had 670 members in the House of Commons. England is represented by 465 members, Wales 30, Scotland 72, and Ireland 103.

The King in 1915 was George V, born June 3, 1865; he succeeded to the throne May 6, 1910,

as the second but only surviving son of Edward VII. He married July 6, 1893, Princess Victoria Mary, only daughter of the late Duke of Teck. Heir-apparent, Edward Albert, Prince of Wales, born Dec. 14, 1895.

HISTORY

THE GOVERNMENT'S TASK. The endeavors of the government to find money, men, and munitions for the prosecution of the war constituted the outstanding feature of British politics during the year 1915. It was comparatively easy to supply the money, although the increasing burden of the war debt might well give rise to solicitude for the future. Guns and ammunition were less readily obtained: the construction of new munition factories and the organization of the industry entailed painful delay, and the rules of the trade-unions hampered the work. Even more arduous was the task of suddenly creating an enormous army without doing violence to the cherished traditions of the people by establishing compulsory military service. These three great problems—finance, the supply of munitions, and the recruitment of the army—are separately discussed in the paragraphs that follow.

THE COST OF THE WAR. Providing the huge sums required to defray her own and part of her allies' expenses in the war was the least of Great Britain's difficulties. In his budget speech of May 4th, the chancellor of the exchequer, Mr. David Lloyd George, informed the House of Commons that the daily cost of the war to Great Britain, not including the sums advanced to colonies and allies, then stood at about £2,100,000 a day. The total expenditure for the year 1915-16, if the war continued, would amount to about £1,322,654,000—more than double the expenditure for 1914-15. About one-third of this sum would be raised by taxation; the deficit would be no less than £862,322,000, and would have to be raised by internal loans. The estimate of the war's cost made by Mr. Lloyd George in May was soon exceeded in fact. Hardly a month after Lloyd George had stated the daily expenditure to be £2,000,000, Mr. Asquith announced that the daily cost had risen to an average of £2,660,000, and that during the next three months at least £3,000,000 a day would be expended. At the request of the government, Parliament authorized an issue of securities up to a maximum total of £1,000,000,000, at 4½ per cent interest. In order to induce the middle and lower middle classes to invest, five shilling shares of the new loan were offered on sale at post offices. The effect of the war expenditure upon Great Britain's economic life was explained by Mr. Asquith in a speech in the Guildhall June 27th. Before the war, the annual income of the nation had attained a figure somewhere between £2,250,000,000 and £2,400,000,000; the annual expenditure of the nation was estimated at about £2,000,000,000. Thus there was a surplus of from £250,000,000 to £400,000,000 which could be saved or invested, and which would ordinarily be available for the purchase of government loans. But the amount needed for the war was now £1,000,000,000 a year. The balance of trade, moreover, had turned against Great Britain. Comparing board of trade statistics for the first five months of the year 1915

with those for the same period a year ago, it appeared that imports had increased by £35,500,000 while exports and re-exports had fallen off by £73,750,000. These figures signified, the speaker went on to say, that in five months nearly 110 millions sterling had been added to Great Britain's foreign obligations, "and if that rate continued until we reached the end of a completed year, the figure of our indebtedness would rise to over 260 millions." In order to correct this balance of trade, imports of luxuries must be rigorously curtailed; tea, tobacco, wine, sugar, and petrol must be used sparingly, if at all; and the nation must learn thrift and save money to invest in the war loans. In this connection it may not be amiss to remark that the need for economy was hardly less pressing in England than in Germany, for although the seas remained free to British trade, the cost of living had increased at an alarming rate. In London the price of wheat had risen from 34s. 11d. just before the war to 45s. at the beginning of the year 1915.

KITCHENER'S ARMY. The result of Lord Kitchener's labors as minister of war, in raising, drilling, and equipping a vast volunteer army to reinforce the puny original expeditionary force of three army corps, was indicated in April when the chancellor of the exchequer, Mr. David Lloyd George, speaking in the House of Commons, revealed the fact that altogether 36 divisions or about 750,000 men had been sent to the front. "Kitchener's army" was a wonderful achievement, in the face of almost insuperable obstacles, such as the difficulty of raising a large army on a purely voluntary basis, and the absence at the outset of any organization or equipment adequate to deal with such numbers of men. Nevertheless when "Kitchener's army" was compared with Joffre's army, and the length of the battle line held by British troops was compared with the length held by the French, it was patent that Great Britain was not doing her full share. Two or three million men were needed. Hints of conscription were heard. Newspaper correspondents asserted that complaints were being raised in France at England's failure to furnish a larger contingent. On May 18th Lord Kitchener issued a call for 300,000 new recruits. In June Premier Asquith announced that the total number of men for army and navy sanctioned by Parliament—3,200,000—would not be exceeded without the authority of Parliament. Meanwhile enlistment continued regularly, but without the alacrity and spontaneous enthusiasm which might have been desired. It was necessary for eloquent speakers to tour the country, addressing mass meetings, to urge young men to enlist. Still recruiting lagged. On August 15th a National Register or census was taken of all persons, of both sexes, between the ages of 15 and 65, so that the government might have exact information of the numbers available both for service in the army and for labor in munitions factories. On the following day, August 16th, the journals owned by Lord Northcliffe opened a campaign in favor of compulsory "National Service." The *London Times* published a manifesto in favor of National Service, signed by a number of prominent men, including Sir F. G. Banbury, Lord Charles Beresford, the Bishop of Birmingham, Lord Denman, Sir Edward Elgar, Sir Rider Haggard, Sir Starr

Jameson (author of the "Jameson Raid"), Lord Northcliffe, Sir Arthur Pinero, and Sir William Ramsay. The *Daily Mail* published the same manifesto, accompanied by a furious editorial attack upon voluntary service, and a suggestion that local committees organize mass meetings to demand compulsion. From the middle of August to the end of the year, the campaign for National Service increased in intensity, and the hot debate between advocates of compulsion and defenders of free enlistment loomed larger and larger upon the political horizon.

THE SHORTAGE OF MUNITIONS. More serious than either the question of finance or the difficulty of recruiting was the shortage of munitions. According to a statement made by Mr. David Lloyd George in the House of Commons, Great Britain had made wonderful progress in manufacturing artillery ammunition: if 20 be taken as representing the output in September of 1914, in October the output was 90; in November, 90; in December, 156; in January, 186; in February, 256; in March, 388. Still the supply was insufficient, and the shortage of munitions was undeniable. On March 15th Lord Kitchener gravely warned the House of Lords that "the work of supplying and equipping new armies depends largely on our ability to obtain the war material required." Armament firms, to be sure, and most of the employees had responded nobly to the demands laid upon them, but still the minister of war was obliged to admit that "the output is not only not equal to our necessities, but does not fulfill our expectations." Orders had not been filled on time. The lack of labor was hampering the munitions factories. Idleness, slack work, drunkenness, and trade-union restrictions were responsible for the dire plight in which the nation found itself, in so far as they hindered work on munitions orders. Perhaps the laboring classes were misled by the fatuous confidence in Great Britain's ability to win the war without half trying, Lord Kitchener suggested. His only comment on such confidence was this: "I can only say that the supply of war material at the present moment and for the next two or three months is causing us very serious anxiety, and I wish all those engaged in the manufacture and supply of these stores to realize that it is absolutely essential not only that the arrears in the deliveries of our munitions of war should be wiped off, but that the output of every round of ammunition is of the utmost importance and has a large influence on our operations in the field." A new Defense of the Realm Bill, which was being submitted to the consideration of the House, would help, Lord Kitchener hoped, to expedite the manufacture of munitions. As for the complaint of the laborers that they were unjustly treated, Lord Kitchener observed, "Labor may very rightly ask that their patriotic work should not be used to inflate the profits of the directors and shareholders of the various great industrial and armament firms, and we are therefore arranging a system under which the important armament firms will come under government control, and we hope that workmen who work regularly by keeping good time shall reap some of the benefits which the war automatically confers on these great companies." The new Defense of the Realm Act, submitted to Parliament in March, to which the war minister referred, gave the government power to



JAMES KEIR HARDIE
 Labor Leader in House of Commons
 Died September 26, 1915



Admiral SIR HENRY R. BRADWARDINE JACKSON
 First Sea Lord of the Admiralty



WINSTON SPENCER CHURCHILL
 First Lord of the Admiralty, 1911-1915



EARL OF DERBY
 Author of Recruiting Bill

FOUR FIGURES PROMINENT IN GREAT BRITAIN IN 1915

take and exercise control over manufactories capable of being used for the manufacture of munitions, as well as over factories already engaged in that work. In the hope of securing more loyal coöperation from the laborers, Mr. Lloyd George and Mr. Runciman (president of the board of trade) conferred with representatives of the trade unions, March 17th and March 19th. The agreement was reached that (1) during the war there was to be no stoppage of work on the munitions and equipment ordered by the government; (2) disputes were to be settled by conferences between the men and their employers, or in case of deadlock referred either to the Committee on Production, to a single arbitrator appointed by the board of trade, or to a Court of Arbitration representing equally capital and labor; (3) an advisory committee representing the munitions workers was to be appointed by the government; (4) trade-union regulations, especially the restrictions upon the employment of semi-skilled and female labor in union shops, were to be relaxed during the war, on the assurance that no diminution of pay would result from the introduction of cheaper labor. During March also a strong movement was set on foot to restrict or prohibit the use of alcohol, so that the labor of the munitions workers would be more efficient. King George himself set an example to the nation in this respect by announcing, the first week in April, that henceforth the use of alcoholic beverages would be prohibited in the royal household. In May the Parliament authorized the government to regulate the sale of liquor in areas where the munitions of war were being made, and a Central Board of Control was nominated, under the chairmanship of Lord D'Abernon. In spite of the measures taken by the government to increase the output of munitions, the shortage continued to cause complaint and criticism in the press. The London *Times'* military correspondent asserted May 12th that in attacks at Fromelles and Richebourg, "the want of an unlimited supply of high explosive was a fatal bar to our success." To break through the hard crust of the German line in France and Belgium, he asserted, "we need more high explosives, more heavy howitzers, and more men."

ATTITUDE OF THE INDEPENDENT LABOR PARTY. The difficulty experienced by Great Britain in meeting the demand for more men and more munitions was partly due to the attitude of the laboring classes. The Socialist Independent Labor Party, although representing only a fraction of organized labor, was influential in propagating doubt as to the justice of Great Britain's cause, and in raising the question in the minds of at least a few workingmen, whether after all democracy was to be furthered by waging war in alliance with the Tsar. A conference of the Independent Labor Party met at Norwich, April 5th, reflected Mr. Jowett as chairman, and by an almost unanimous vote resolved: "That this conference expresses its strong disapproval of the action of the Labor Party [the Labor Party, it should be noted, represented the bulk of the trade unions, whereas the Independent Labor Party represented the Socialist minority] in taking part in a recruiting campaign, and of Independent Labor Party members of Parliament speaking from platforms on which attempts were made to justify the war and the foreign policy of the Liberal government which

led up to the war." While they were at Norwich, many of the Independent Labor Party delegates attended the meeting of the Union of Democratic Control, whose object was to abolish secret and undemocratic diplomacy. Mr. Ramsay McDonald, who presided over the meeting, declared that Russia was fighting for power in the Balkans and France for revenge; that Prussian militarism could not be crushed by war, but must be destroyed from within. This extremely diffident attitude towards the war, let it be repeated, was not shared by the majority of the workingmen. Nevertheless it must be admitted that a very widespread discontent was manifested, chiefly as a result of the increase in the cost of living without a simultaneous commensurate increase of wages. During the period from January to May, 286 labor disputes, strikes, or lockouts were reported, affecting 109,693 men. Two-thirds of the strikes were caused by the demand for higher wages, and at least 12 by the attempt of employers to maintain the "open shop" system. The total time lost amounted to 762,900 days. In the coal-mines, and in the munitions industry, the workers complained that they were being forced to work long hours, without an adequate increase of pay, while the cost of living had increased, and the employers were enjoying unprecedented profits. Any attempt on the part of the government to coerce munitions workers, or to introduce compulsory military service, would encounter the most stubborn opposition from organized labor.

THE COALITION CABINET. In May a cabinet crisis was precipitated by the quarrel (see below, *Churchill's Resignation*) between Winston Spencer Churchill, first lord of the admiralty, and Lord Fisher, first sea lord. The latter resigned May 14th; at the same time Mr. Churchill offered to resign. In view of the demand which had of late become insistent, that the Opposition be allowed some voice and some responsibility in the cabinet during the war, Mr. Asquith decided to take this opportunity for the reconstruction of the cabinet and the formation of a Coalition government. Lord Haldane, Lord Beauchamp, Mr. Hobhouse, Mr. Herbert Samuel, Mr. Pease, Mr. Montagu, Lord Lucas, and Lord Emmot were asked to resign their posts, and in their stead eight Unionists were brought into the cabinet. By creating 2 new places in the cabinet, bringing the total up to 32, room was made for a Labor member and another Liberal; so that the Coalition cabinet included 12 Liberals, 8 Unionists, 1 Labor member, and Lord Kitchener. The apportionment of portfolios, as announced May 25th, was as follows: Prime minister and first lord of the treasury, Mr. Asquith (Liberal); minister without portfolio, Lord Lansdowne (Unionist); lord chancellor, Sir S. Buckmaster (Liberal); lord president of the council, Lord Crewe (Liberal); lord privy seal, Lord Curzon (Unionist); chancellor of the exchequer, Mr. Reginald McKenna (Liberal); secretary of state for home affairs, Sir John Simon (Liberal); secretary of state for foreign affairs, Sir Edward Grey (Liberal); secretary of state for colonies, Mr. Andrew Bonar Law (Unionist); secretary of state for India, Mr. J. Austen Chamberlain (Unionist); secretary of state for war, Lord Kitchener; minister of munitions (a newly created port-

folio), Mr. David Lloyd George (Liberal); first lord of the admiralty, Mr. Arthur J. Balfour (Unionist); president of the Board of Trade, Mr. Walter Runciman (Liberal); president of the Local Government Board, Mr. Walter Hume Long (Unionist); chancellor of the Duchy of Lancaster, Mr. Winston Spencer Churchill (Liberal); resigned November, 1915, succeeded by Mr. Herbert Samuel (Liberal); chief secretary for Scotland, Mr. McKinnon Wood (Liberal); president of the Board of Agriculture and Fisheries (not previously a cabinet office), Lord Selborne (Unionist); first commissioner of works, Mr. Lewis Harcourt (Liberal); president of the Board of Education, Mr. Arthur Henderson (Labor); attorney-general, Sir Edward Carson (Unionist), resigned October, 1915, succeeded by Sir Frederick Edwin Smith (Unionist); chief-secretary to the lord-lieutenant of Ireland, Mr. Augustine Birrell (Liberal). Outside of the cabinet, important ministerial positions were assigned to Mr. H. Samuel (postmaster-general), Mr. F. E. Smith, (solicitor-general), and Mr. Montagu (financial secretary to the treasury). In respect of the new cabinet, it should be noted that Unionists were placed in charge of India, the colonies, the navy, and agriculture; that the Labor member, Mr. Henderson, on the other hand, was not assigned to a post where his partisan convictions were likely to find expression; that Mr. Winston Churchill was removed from the admiralty and given a post without special responsibility; that the Irish Nationalist leader, Mr. Redmond, although offered a place in the Coalition cabinet, refused to accept a government office while Home Rule was still denied to Ireland, and an Ulster Unionist (Sir Edward Carson) sat in the cabinet; and, finally, that after seven historic years as chancellor of the exchequer, Mr. David Lloyd George, the eloquent Welsh land-reformer, resigned the ministry of finance into the hands of Mr. McKenna, and undertook a new and arduous responsibility as minister of munitions. Of interest to students of constitutional history was the bill introduced immediately after the formation of the Coalition government, to render the reelection of newly appointed cabinet officers unnecessary during war time. The reason which led to this important departure from a venerable precedent was the obvious inexpediency of requiring a newly appointed minister to undertake an electoral campaign, distracting his attention from his ministerial functions, just at the time when his undivided energies were demanded by the nation.

LLOYD GEORGE AND MUNITIONS. The bill to establish and define the powers of the minister of munitions was introduced in the House of Commons the first week in June, by the home secretary, Sir John Simon. The extraordinary character of the powers which the bill conferred upon the new minister evoked violent criticism in the House of Commons, June 7th. Mr. Pringle (Liberal) expressed his abhorrence of the provisions which, he claimed, would give the minister of munitions power to "socialize" labor. A Labor member, Mr. Philip Snowden, vigorously opposed compulsion and "forced labor." An Irish Nationalist believed that the bill would force "slavery" upon the working classes, and demanded to know of what avail it would be to destroy German militarism, if liberty were deliberately abolished in the United

Kingdom; Mr. Hobhouse warned the government against introducing compulsory labor. Mr. Crooks (Labor) expressed the fear that "conscript labor" was contemplated. Sir John Simon quelled the storm of criticism by disclaiming any intention on the part of the government to impose any compulsion upon labor. In course of the debate Sir R. Cooper made the astonishing statement that he had offered, as long ago as April 21st, to supply 5,000,000 shells, and desired to know why his offer was not accepted. Despite hostile criticism, the Ministry of Munitions Bill was passed by both Houses of Parliament and received the royal assent, June 9th. With an energy that promised well for the future, Mr. David Lloyd George now threw himself into the work of his new department. On June 23rd he came forward with a Munitions Bill, which embodied the chief points of his programme: (1) Strikes and lockouts were to be made illegal in the munitions plants, and industrial disputes were to be settled by compulsory arbitration; (2) the short-sighted policy which had permitted skilled workers to be drafted into the army from the munition plants was now to be reversed, and the skilled munitions workers who had enlisted were to be brought home again; (3) seven days were to be allowed for the voluntary enrollment of skilled men in a mobile munition corps, the enrollment being conducted by the trade unions, and the recruits being given a certificate instead of a uniform to show that they were engaged in patriotic service; (4) government control over munitions workshops was to be established, "slackers" were to be fined, and a Munitions Court was to be constituted; (5) trade union regulations, in so far as they hampered the work, were to be suspended; and (6) employers' profits were to be limited. During the debate on the Munitions Bill, an important revelation was made by Mr. Pease, former minister of education. The government at the beginning of the war, he affirmed, had no idea of the large proportion of high explosives or the number of machine-guns or the type of hand grenade which would be used in trench-warfare. Lord Kitchener, he implied, had been more far-seeing than the other ministers, and had continually urged the necessity of providing in advance for the materials which might be required in a long and stubbornly contested war. The Munitions Bill was finally passed by Parliament the first week in July, with an amendment somewhat weakening the government's power to enforce the arbitration of industrial disputes. By July 12th 90,000 men had been enrolled as munitions workers under the new plan. By July 28th 16 national munitions factories had been established in England, and 10 more, it was announced, would soon be erected. Early in August a board of 25 scientists and engineering experts was created to examine inventions and improved appliances for the munitions ministry. On August 12th the minister announced that in addition to the "national" munitions plants, 345 "controlled establishments" were engaged on government work. In "controlled establishments" the owner, for his part, consented to turn his excess profits over to the national exchequer, while the workmen consented to suspend restrictive trade-union regulations. In September it became evident that the government was living up to the provision of the Mu-

nitions Bill which provided for the establishment of Munitions Courts to fine delinquent workmen. A large number of Cammell, Laird and Company's men were fined for loss of time, the aggregate loss of time in 20 weeks having amounted to about 1,500,000 hours, and the fines varying from 5 to 60 shillings. The result of a little more than two months' work on the part of the able minister of munitions was indicated on September 15th, when the government announced that 715 munitions factories, employing 800,000 workmen, had been constituted as "controlled establishments," and in addition the ministry of munitions had constructed 20 shell factories and was constructing 18 more.

LABOR DIFFICULTIES. In September the failure of the government to enlist the hearty sympathy and support of the laboring classes began to cause grave concern. Strikes in the Welsh coal mines threatened to tie up industry in general and to cripple the munitions trade in particular. (For further information regarding the strike see **STRIKES AND LOCKOUTS**, *Great Britain*.) The minister of munitions, moreover, found that his most eloquent appeals were unavailing to secure a sufficient supply of labor for his munitions factories. In order to stir up enthusiastic patriotism, delegations of workers were sent to visit the front. The first of these delegations, upon its return, issued an appeal to labor—"We have brought the needs of your fellow workmen at the front before you . . . and we expect and believe you will not fail them." Mr. Lloyd George in person attended the Trade Union Congress, September 9th, so that he might answer the complaints of the trade unionists. In reply to the charge that the munitions workers were being forced to work overtime for the profit of the factory-owners, Mr. Lloyd George pointed to the national arsenals which had been established, and the limitation which had been imposed on profits in "controlled establishments." He in his turn complained that by insisting upon the strict observance of their rules, the trade unions were fatally hampering a most vital work. For example, at Woolwich Arsenal the engineers had refused to allow semi-skilled persons to do the work of qualified mechanics. In South Wales, the unions had refused to permit the operation of lathes by semi-skilled workers. In a large tool-making firm the workers had vetoed the employment of women to operate lathes. Such restrictions on the employment of unskilled labor must be abandoned during the war; and the unions must help the government to find the 80,000 skilled workmen and the 200,000 unskilled laborers who were urgently needed for munitions work. Owing to the shortage of labor, Mr. Lloyd George said, at least 15 per cent of the machines for turning out rifles, cannon, and shells were standing idle every night. "If the attitude of the Woolwich engineers is to be adhered to," he declared, "we are making straight for disaster." The same warning was repeated by Mr. Lloyd George in December, when he said that success or failure in the war depended upon his securing permission from organized labor to recruit 200,000 unskilled workers for the munitions plants.

IRISH HOME RULE AND WELSH DISESTABLISHMENT. Since the Irish Home Rule Bill had not yet come into operation, although passed for a

third time by the House of Commons in 1914 (consult the *YEAR BOOK* for 1914) in accordance with the provisions of the Parliament Act, a certain amount of solicitude was expressed in Ireland lest a Unionist ministry, coming into power during the war, might strike the act from the statute book and cheat Ireland of the boon for which the Irish Nationalists had so stubbornly fought. The emotions may well be imagined with which the Nationalists contemplated the establishment of the Coalition ministry, in which Sir Edward Carson, the leading antagonist of Home Rule, occupied an honorable position. By the Suspensory Act of September, 1914 (consult the *YEAR BOOK* for 1914, *GREAT BRITAIN, History, The War and the Irish Question*), the Irish Home Rule Act had been suspended until the expiration of 12 months from the date of passing, i.e. until Sept. 18, 1915, or "until such later date (not being later than the end of the present war) as may be fixed by His Majesty by Order in Council." The anticipation of the Irish Nationalists that the Coalition cabinet, instead of permitting the act to come into effect in September would take advantage of the loophole permitting a further suspension, was realized when on Sept. 14, 1915, the government published an Order in Council as follows: "If at the expiration of 12 months from the date of the passing of the said acts (Irish Home Rule and Welsh Disestablishment) the present war is not ended—(1) No steps shall be taken to put the Government of Ireland Act, 1914, into operation until the expiration of 18 months from the date of the passing of that act unless the present war has previously ended, nor if at the expiration of those 18 months the present war has not ended until such later date, not being later than the end of the present war, as may hereafter be fixed by Order in Council. (2) The date of disestablishment under the Welsh Church Act, 1914, shall be postponed until the end of the present war."

FURTHER WAR CREDITS. When the House of Commons reassembled, September 14th, after its summer recess, it was called upon to consider two principal problems, finance and recruiting. The *London Times* editorially remarked, "Upon its (Parliament's) decisions during the next few weeks may depend the fortunes of the war and the future of the civilized world." A war credit of £250,000,000 was demanded by Premier Asquith, September 15th, to cover expenses up to November 15th. The total credits to date amounted to £1,262,000,000, since Aug. 6, 1914. The government, it was announced, had repaid £50,000,000 to the Bank of England, and had lent £28,000,000 to the dominions, £250,000,000 to other belligerents, and £30,000,000 to other foreign governments. The average daily cost of the war had shown a steady tendency to rise, from £2,700,000 during the period from April 1st to June 30th, to £3,000,000 from July 1st to July 17th, and £3,500,000 from July 17th to September 11th. During the next month Great Britain's gross daily expenditure would not exceed, on the average, £5,000,000.

RECRUITING. In asking for the new credit, Mr. Asquith made the important but very vague statement that from first to last, including both army and navy, "not far short of 3,000,000 men" had offered themselves for service. The total casualties numbered 380,000, although

many of these had been slight wounds from which recovery was speedy. In the House of Commons the debate on the war credits became a debate on conscription. In the House of Lords, September 15th, Lord Kitchener, while expressing his satisfaction at the "large increase in the number of heavy guns" which had been supplied, and reporting that 11 new divisions had been sent to occupy an additional 17 miles of the front in France, acknowledged that recruiting had recently declined, and anxious consideration was being given to the best means of securing recruits.

LABOR OPPOSITION TO CONSCRIPTION. While Parliament and the press in September seemed to incline towards compulsory military service as a solution for the recruiting problem, organized labor put itself on record as absolutely opposed to any such scheme. On September 7th, the Trade Union Congress at Bristol resolved: "That we, the delegates to this Congress, representing nearly 3,000,000 organized workers, record our hearty appreciation of the magnificent response made to the call for volunteers to fight against the tyranny of militarism. We emphatically protest against the sinister efforts of a section of the reactionary press in formulating newspaper policies for party purposes and attempting to foist on this country conscription, which always proves a burden to the workers, and will divide the nation at a time when absolute unanimity is essential. . . . We believe that all the men necessary can, and will, be obtained through a voluntary system properly organized, and we heartily support and will give every aid to the government in their present efforts to secure the men necessary to prosecute the war to a successful issue." Something in the nature of a threat was conveyed in the words which Mr. J. H. Thomas, as the representative of the railway men, uttered in the House of Commons, September 16th—"The first day this principle (compulsory service) was introduced the government would have to deal, not with compulsory service, but perhaps unfortunately with industrial revolution." The British workmen were engaged in a fight against German militarism: they did not want militarism introduced into Great Britain. The same confident belief that the voluntary system would and must suffice was expressed by a conference, September 30th, of the Parliamentary Committee of the Trades Union Congress, the Management Committee of the General Federation of Trade Unions, the Executive of the Labor Party, and members of the Parliamentary Labor Party. It was largely as a result of this obstinate opposition to conscription expressed by labor organizations, that Lord Derby's recruiting campaign was launched in October as the last and final effort of the government to maintain the army on a voluntary basis (see below, *The Derby Recruiting Campaign*).

THE BUDGET. The third budget since the beginning of the war, and the largest in the world's history, was presented to Parliament, September 21st, by the chancellor of the exchequer, Mr. Reginald McKenna. He estimated that the army alone would cost £715,000,000 during the coming year; the navy would cost £100,000,000; advances to dominions and allies would amount to £423,000,000; food supplies, miscellaneous expenditures, and outstanding obligations would require £92,000,000; while for the ordinary ex-

penses of government only £170,000,000 was demanded. The total expenditure would be £1,590,000,000. To furnish this stupendous sum, Mr. McKenna counted upon regular taxes to the amount of £272,110,000; new taxes to the amount of £30,924,000; postal changes to bring in £1,980,000; and loans to cover £1,285,000,000. By the end of March, 1916, Great Britain's public debt would reach the staggering figure of £2,200,000,000. The new taxes which Mr. McKenna proposed may be briefly summarized: (1) a 40 per cent increase of the income tax, with a lowering of the exemption from £160 to £130, so that persons earning £2 10s. a week would have to contribute, and so that the rate on an earned income of £200 a year would be £7, 3s., 4d.; (2) an increase in the supertax on incomes over £8000, so that the possessor of an income of £100,000 would be taxed £34,000; (3) a 50 per cent tax on war-profits, which was expected to bring in £30,000,000; (4) duties increased 50 per cent on tea, tobacco, cocoa, coffee, and chicory, and 100 per cent on motor-spirit and patent medicine; (5) a new ad valorem duty of 33½ per cent on imported motor-cars, motorcycles, cinema films, clocks, watches, musical instruments, plate glass, and hats; and (6) increases in the rates for post, telegraph, and telephone. It is worth noting that item 5 marked a step towards tariff reform. It is also significant that the army was now costing £115,000,000 more than Lloyd George had estimated in the spring.

THE RESIGNATION OF SIR EDWARD CARSON. On October 18th, Sir Edward Carson announced his intention of resigning his post as attorney-general in the cabinet. Two days later he explained the reason for his resignation as his inability to concur in the Balkan policy recently enunciated by Sir Edward Grey. Not until a month later did the public learn the details of the split. At the last War Committee meeting (a small committee of the cabinet had been selected to direct the war policy) before his resignation, it seemed, the decision had been taken that it was too late to send assistance to Serbia (consult *WAR OF THE NATIONS, The Drive Through Serbia*); as he had believed it to be both possible and necessary for Great Britain then to aid Serbia, Sir Edward had tendered his resignation. Later, he sarcastically added, when M. Millerand (French war secretary) "came over here with a view to inducing the government to change this policy" of non-assistance and when General Joffre himself urged it, Mr. Asquith had decided that assistance to Serbia would even then be opportune. In reply to Sir Edward Carson's implied criticism, Mr. Asquith stated, November 18th, that assistance had been sent to Serbia without the slightest delay.

CHURCHILL'S RESIGNATION. Less than a month after Sir Edward Carson's resignation, the cabinet lost another member, Mr. Winston Spencer Churchill, who had quarreled with Lord Fisher in May, it will be recalled, and had been transferred from the important post of first lord of the admiralty in the old Liberal cabinet to the minor office of chancellor of the Duchy of Lancaster in the Coalition cabinet. Mr. Churchill's resignation was precipitated by the formation of a War Council or inner cabinet composed of Mr. Asquith, Mr. Balfour, Mr. Bonar Law, Mr. McKenna, and

Mr. Lloyd George. The premier had offered him a place in the War Council, Mr. Churchill admitted, but he had been unwilling to share in the general responsibility for the government's war policy without any personal share in its control. In a letter to Mr. Asquith dated November 11th, Mr. Churchill informed the prime minister of his resignation; in a speech before the House of Commons on November 15th he made a public and spirited defense of his conduct while in office. He had been criticized as personally responsible for (1) the destruction of Rear Admiral Craddock's fleet in the battle off Coronel, (2) the loss of the cruisers *Cressy*, *Hogue*, and *Aboukir*, (3) the disastrous failure of the expedition sent to relieve Antwerp, and (4) the Dardanelles fiasco. On all four points, Mr. Churchill's defense was vigorous and convincing. In regard to the Coronel battle, the Admiralty arrangements had been made with the full consent of naval experts, and were "probably the best that could have been made." The exposure of the three cruisers to the peril of submarines was not his mistake, and he was willing to have the Admiralty memoranda on the subject published, although "the papers might do injury to officers who are now serving and to others." (3) The Antwerp expedition had been undertaken without consulting him, and had originated with Lord Kitchener and the French government; he had taken an energetic part in perfecting arrangements for it, but could not be held responsible; moreover, the expedition could not be called an unmitigated failure, for although it had not saved Antwerp, it had the effect of "causing the great battle to be fought on the line of the Yser instead of 20 or 30 miles further south." As for the Dardanelles campaign, it had been undertaken with the approbation of naval experts, but had not received the hearty and loyal support, after it had been begun, which the first sea lord, Lord Fisher, should have given it. Had the Dardanelles expedition been properly supported, Mr. Churchill believed it might have achieved a brilliant victory and vitally affected the issue of the war. (A detailed discussion of the expedition, and of Mr. Churchill's comments upon it, will be found under the WAR OF THE NATIONS.) Mr. Churchill was succeeded by Mr. Herbert L. Samuel, November 25th.

PARLIAMENT IN DECEMBER. In December the government introduced a bill to prolong the life of Parliament 12 months beyond its normal duration, until Jan. 31, 1917. To the principle of this very important departure from constitutional practice, which involved the question of whether sovereignty rested in Parliament or the electors, little objection was raised; considerable opposition was encountered, however, because the proposed extension of the mandate of the present Parliament would make it possible for the Plural Voting Bill, which had already been passed twice by the House of Commons and twice rejected by the House of Lords (see the 1914 YEAR BOOK, p. 324), to be passed a third time by the House of Commons and enacted under the provisions of the Parliament Act. In consequence of this opposition, Mr. Asquith found it necessary to propose, as a compromise, that the prolongation of Parliament's life be made for 8 instead of for 12 months. In December Parliament was informed

that as an object lesson to the nation, the members of the cabinet had decided to reduce their own salaries. A rumor, of prime importance if true, but probably without foundation, was given great prominence in the press towards the close of the year, that Sir Edward Carson was endeavoring to form a new group in the House of Commons, to pursue a more vigorous and a more clearly defined policy in the prosecution of the war to a successful conclusion.

THE DERBY RECRUITING CAMPAIGN. The close of the year was made memorable by a great campaign for recruits, conducted under the direction of Lord Derby. The Derby campaign, begun in October and continued into the middle of December, was the final effort of the government to find a method of securing a sufficient number of recruits for the army without forcing compulsory military service upon the unwilling workingmen. With blue cards containing names copied from the National Register, soldiers and civilians made a personal canvass of the men who had not enlisted. In order that the "slackers" who refused to volunteer might be made more ignominiously conspicuous, armbands of khaki were to be given (1) to men who had enlisted and were waiting to join the colors, (2) to men who were willing but physically unfit to serve in the army, and (3) to soldiers incapacitated for further service. Each class was to be distinguished by a different type of armband. To stimulate patriotism, King George issued an appeal to the nation calling for volunteers. The men who hesitated were warned that if the voluntary system failed, compulsion would be introduced. The premier publicly announced that if the unmarried men held back, he would use compulsory methods to bring them forward, before he would ask the married men to go to the front. At the conclusion of the Derby campaign in the middle of December, before any definite announcement of the results was made, the fact was already patent that, in spite of entreaties and warnings, a very considerable number of the single men had not come forward; consequently the British press urgently and insistently called upon Mr. Asquith to make good his "pledge to the married men," by introducing a conscription bill. Later in December while the result of the Derby campaign was still a matter of speculation, Parliament was asked to authorize an increase of the maximum strength of the army from 3,000,000 to 4,000,000. Great Britain, Mr. Asquith on this occasion announced, was maintaining 1,250,000 men in the field; and since about 15 per cent of the men were lost or disabled every month, at least 2,250,000 men must be kept in reserve to maintain the field army at its actual strength during the year 1916. The army increase was voted before Parliament adjourned for the Christmas holidays, but not before the Irish Nationalists and the Laborites had found occasion to declare that they would oppose any resort to compulsory military service. As a result of the Derby campaign, official reports stated, 1,150,000 bachelors and 1,679,263 married men had presented themselves; 428,853 of these volunteers had been rejected as physically unfit, and many more would be unavailable for military service. Lord Derby estimated the net yield of his campaign at 831,062 men, including 215,431 actually enlisted and 615,631 available men "attested" for future service. Over 1,000,-

000 bachelors and a slightly larger number of married men had refused to enroll themselves; to be sure, 827,878 of these "slackers" were "starred" men, who could not be spared from industry, but 651,160 unmarried men who had not responded to Lord Derby's call, it was estimated, would be available if they could be induced to volunteer. The demand of the National Service advocates was that these 651,160 irresponsible bachelors be compelled to enlist. The question was destined to be finally decided when Parliament resumed its sittings, beginning Jan. 4, 1916. Press reports at the very close of December indicated that although the government was determined to introduce compulsory service for unmarried men, the ministry was badly divided and certain members of the cabinet, notably Sir John Simon and Mr. Arthur Henderson, had decided to offer their resignations.

SPIES AND SUSPECTS. Numerous German spies were detected in treasonable activities during the year. One of the most notorious cases was that of Anton Kuepferle, a self-confessed German soldier, who committed suicide in prison, May 20th, rather than submit to the humiliation of public execution. Two other spies, F. R. Muller and Hahn, were arrested with Kuepferle, and one of them, Muller, was executed in the Tower June 23rd. On July 15th a naval spy, Robert Rosenthal, was executed. A number of spies, whose names were not divulged, were also executed after trial by court-martial. One alleged spy, Gustav Triest, a freshman at Princeton University, was acquitted and released, November 19th. As a result of the activity of spies, and in consequence of the violent popular excitement caused by German Zeppelin raids and submarine exploits, a veritable panic of anti-German sentiment swept over the British public. Anti-German riots were of frequent occurrence until the Germans resident in England were interned in concentration camps. After the sinking of the *Lusitania* the names of the German Emperor, the Crown Prince, and other German and Austrian royalties were ordered stricken from the list of Knights of the Garter. Sir Edgar Speyer, in consequence of the accusations of disloyalty which were popularly brought against him, was constrained to resign his office of privy councillor. Sir Ernest Cassel, likewise of German birth, felt it incumbent upon himself to issue a public declaration of his unabated loyalty to Great Britain. Even Lord Haldane, who had rendered the country such conspicuous services as a statesman, was regarded with suspicion. See also INTERNATIONAL PEACE AND ARBITRATION; HARDIE, JAMES KEIR; UNITED STATES AND THE WAR; and WAR OF THE NATIONS.

GREECE. A constitutional European monarchy, situated between the Ionian and Ægean seas. It consists of 26 nomes, or departments, besides Crete and the new Turkish cession. The capital is Athens.

AREA AND POPULATION. The area previous to the Balkan wars was given at 64,657 square kilometers (24,964 square miles), with a population in 1907 of 2,631,952. The area, population (1907), and density of the 26 nomes, and also of Crete, together with figures of the new Turkish cession are given in the following table:

	Sq. km.	Pop.	Pop. per sq. km.
Acarnania and Ætolia....	5,225	141,405	27
Achaia	3,136	150,918	48
Arcadia	4,357	162,324	37
Argolis	2,585	81,948	32
Arta	1,888	41,280	30
Attica	3,127	341,247	108
Bœotia	3,117	65,816	21
Cephalonia	763	71,235	93
Corfu	681	99,571	146
Corinthia	2,370	71,229	30
Cyclades	2,719	130,878	48
Elis	2,014	103,800	51
Eubœa	3,895	116,903	30
Eurytania	2,322	47,192	20
Karditsa	2,647	92,941	35
Lacedæmon	3,164	87,106	28
Laconia	1,278	61,522	48
Larissa	3,873	95,066	25
Leucas	457	41,186	90
Magnesia	2,034	102,742	51
Messenia	1,674	127,991	76
Phocia	2,157	62,246	29
Phthiotis	4,622	112,328	24
Trikkala	3,055	90,548	30
Triphylia	1,598	90,523	57
Zante	410	42,502	104
Turkish cession, including Crete	55,400	2,066,647	37
	120,057 †	4,698,599	39

† 46,345 square miles.

Besides Crete, with an area of 8618 square kilometers, the area acquired from Turkey includes the insular districts of Lesbos, Samos, and Chios, the estimated area of which is 4018 square kilometers, and, on the mainland, the districts of Salonica, Kozani, Florina, Serres, Drama, Janina, and Prevesa, aggregating about 42,760 square kilometers. The principal towns with their 1907 population, follow: Athens, 167,479; Piræus, 71,506; Patras, 37,724; Corfu, 27,397; Volo, 23,563; Larissa, 18,041; Trikkala, 17,809; Hermoupolis, 17,773; Pyrgos, 13,690; Zante, 13,580; Kalamata, 13,123; Chalcis, 10,958; Tripolitza, 10,789; Laurion, 10,007. Approximate population of the principal towns in the territory ceded by Turkey: Salonica, 158,000; Candia, or Iraklion (Crete), 25,000; Canea (Crete), 24,200; Kavala, 23,400; Serres, 18,700; Janina, 16,800; Drama, 12,900.

INDUSTRIES. Agriculture is the principal industry, though the methods are antiquated; the chief crops are currants, grapes, cereals, tobacco, citrus fruits, olives, and figs. The area of old Greece under cultivation is given at about 5,563,000 acres—1,112,000 under cereals, 1,200,000 fallow, 2,025,400 under forests. There are in addition 5,000,000 acres under pasture. The principal crop is currants, with an annual average yield of 150,000 tons, which far exceeds the export; the surplus is utilized in the manufacture of denatured alcohol. The law limiting the output has resulted in the uprooting of many large plantations. The cereals grown are wheat, barley, rye, corn, and maslin. The output of currants in 1913 was 160,000 tons; olives, 50,000,000 oke (1 oke equals 2.85 pounds); wheat, 12,593 bushels; tobacco (1912), 86,355 hundredweights, and in the new territories 274,000 hundredweights; figs (1912), 240,000 hundredweights; grapes (1912), 140,551,000 oke. Currant crop (1910-11), 262,500,000 pounds, of which 225,130,412 pounds were exported.

Live stock, as reported for 1914: horses, 149,000; mules, 79,500; asses, 132,800; cattle, 300,-

000; sheep, 3,546,600; goats, 2,638,000; swine, 227,200. Sericulture is carried on.

The output of the principal minerals produced is reported as follows for 1912 and 1913 respectively: iron, 431,632 and 423,569 tons; manganese iron, 14,311 and 21,477; iron pyrites, 29,767 and 26,285; lead, 27,347 and 24,918; nickel, 15,111 and 16,416; zinc, 30,570 and 25,862; magnesite, 62,995 and 52,502; chromite, 6310 and 6930; emery, 8268 and 5649. Some of these outputs are considerably below the amounts produced before the Balkan wars. Mining concessions cover a total of about 20,000 acres.

COMMERCE. Import and export values are stated as follows, in thousands of drachmas (the par value of the drachma is 19.295 cents):

	1909	1910	1911	1912	1913
Imports	137,549	160,586	178,510	157,657	177,938
Exports	101,687	144,571	140,908	146,163	119,001

The principal imports are grains, yarn and textile fabrics, coal, timber, chemicals and drugs, minerals and metal wares, sugar, fish, and coffee. The exports for 1910 of the principal products are given below in drachmas, with the share of the United Kingdom, France, Germany, and the United States in thousands of drachmas; a few only of the articles are given, and totals for each country named:

Exports	U. K.	Fr.	Ger.	U. S.	Total
Currants	22,497	1,064	5,189	4,876	40,528,474
Wine, etc.	1,525	6,154	3,109	289	18,638,504
Olive oil	816	2,667	62	693	17,465,554
Tobacco leaf	90	74	1,595	180	12,051,045
Figs	54	16	822	221	5,887,184
Arg. Lead	1,292	2,639	....	....	10,110,240
Zinc	203	258	642	....	5,144,776
Hematite	2,828	....	513	176	4,296,150
Other	....	....	....	....	....
Total	33,084	15,468	15,097	10,540	144,571,070

As will be seen, Great Britain is the leading country of origin and destination. In the 1911 trade, she contributed imports valued at 40,580,000 drachmas, and received exports to the amount of 33,777,000 drachmas; Russia, 34,449,000 and 2,601,000; Austria-Hungary, 23,721,000 and 13,520,000; Bulgaria, 14,146,000 and 360,000; Germany, 13,336,000 and 16,364,000; France, 10,438,000 and 13,733,000. In 1913 the export of currants was valued at 40,663,000 drachmas; tobacco, 19,616,000; olive oil, 15,317,000; wine, 12,510,000. The trade of Crete for 1911 was valued at 21,359,000 drachmas imports and 15,631,000 exports.

COMMUNICATIONS. Railways (1912), 1609 kilometers. Previous to the outbreak of the Balkan War in 1912, lines from Leontari to Gythion (70 miles) and from Olympia to near Leontari (23 miles) were under construction. The Gravia to Volo line to the Gulf of Corinth was also under way. In 1915 the railway system of Greece in its extent of line open to traffic, included about 950 miles in the so-called "Old Kingdom," or territory occupied by Greece before the conclusion of the second Balkan war, while the new provinces contributed a further 1720 miles. Notwithstanding the hostile conditions, an extensive programme of new lines was drawn up in the early part of the year to develop the country which the Turks had left entirely without railway facilities, especially in Epirus and Crete, and to a less extent in Mace-

donia, where only a few main lines absolutely necessary had been built. The scheme of construction proposed was two lines with a length of 60 miles for Crete, while five lines were to be built in Macedonia, with a total length of 320 miles, the most important of which was the Calambaka-Sarowitz line, 100 miles in length. This last not only was to run through a country entirely devoid of modern transportation facilities, but possessed great strategical importance, as it would enable troops to be concentrated on the northern frontiers. During 1915 20 heavy (2-8-2) locomotives were built by the American Locomotive Company in the United States for the Greek government railways. For other data concerning railroads, and for mileage of telegraph lines, etc., see 1914 YEAR BOOK.

FINANCE. The total revenue for the year 1911 amounted to 136,277,463 drachmas, and the expenditure to 135,094,473. The budget for 1912 estimated the revenue at 144,118,645 drachmas and the expenditure at 143,326,520. Estimated revenue for 1913, 201,162,000 drachmas; expenditure, 253,957,000. The gold debt amounted, Dec. 31, 1912, to 833,581,000 and the paper to 150,009,565 drachmas.

NAVY. The fleet included (July, 1913) 4 ironclads, 1 modern cruiser, 14 destroyers, 4 corvettes, 13 torpedo boats, 2 submarines, and miscellaneous minor craft. The *Salamis*,

launched 1914, has a displacement of 10,500 tons; its principal armament is eight 14-inch guns and 12 6-inch guns; torpedo tubes, 5; horsepower, 40,000; maximum speed, 23 knots. In the summer of 1914 the Greek navy was strengthened by the battleships *Mississippi* and *Idaho*, purchased from the United States, and renamed *Lemnos* and *Kilkis*. These are sister ships, laid down by the Cramps (Philadelphia), May 12, 1904, and commissioned, one Feb. 1, and the other April 1, 1908. The *Mississippi* was built at a total cost of \$5,832,801, and the *Idaho* \$5,892,821. Their displacement is 13,000 tons; mean draft, 24 feet 8 inches; speed, 17 knots; main armament, 4 12-inch and 8 7-inch guns.

GOVERNMENT. The executive authority is vested in the King, who is assisted by a responsible ministry. The legislative body consists of a single Chamber of 316 members, elected by manhood suffrage. The reigning King, Constantine I, succeeded to the throne upon the assassination (March 18, 1913) of his father, George I, son of Christian IX of Denmark, who was elected King by the Greek National Assembly in 1863. Heir-apparent, Prince George, born July 19, 1890. Constantine married, Oct. 27, 1889, Sophia, Princess of Prussia, sister to the German Kaiser.

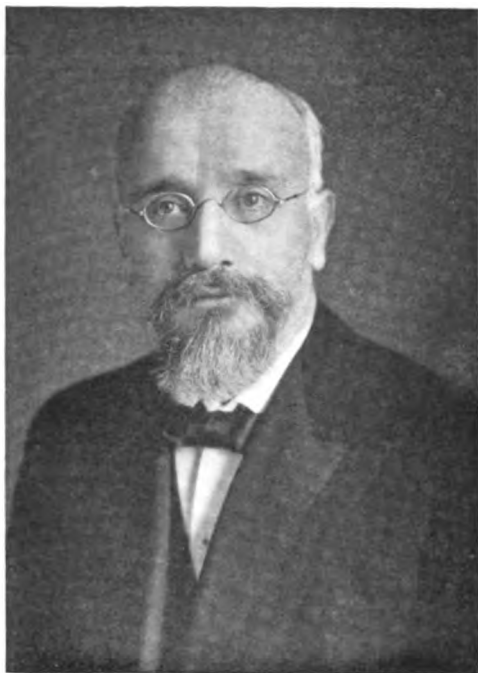
HISTORY

THE QUESTION OF GREEK NEUTRALITY. The vexed question whether Greece should intervene

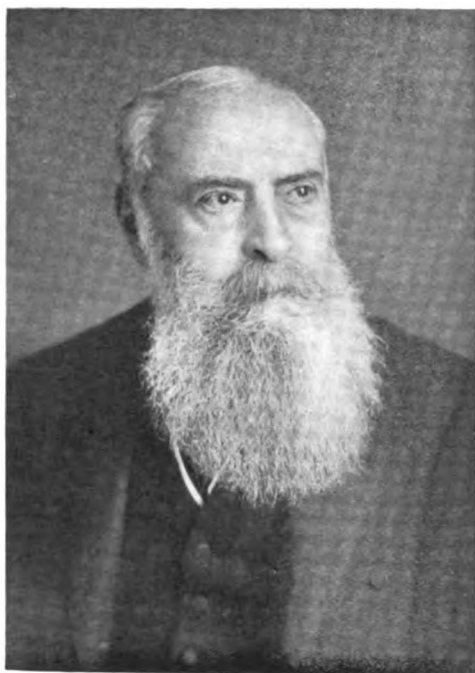
in the great European war completely overshadowed all other issues in Greek politics during the year 1915. The successive cabinet crises through which Greece passed, and the information subsequently divulged by M. Venizelos, made it patent that the indecision of the Greek government was in large part due to the fact that while on one hand the party of M. Venizelos, which controlled the majority of the Greek Parliament, was ardently in favor of the Entente and eager to enter the war in the hope of acquiring territory, the King, on the other hand, with the support of the German-trained army officers, and with the approval of a considerable element of the people, was stubbornly determined not to join forces with the Entente. King Constantine's refusal to intervene in the war was perhaps partly ascribable to the influence of his wife, Queen Sophia, a sister of the German Emperor; doubtless also the admiration for German military methods to which he had frequently given outspoken expression before the war (for example, consult the YEAR BOOK for 1913, p. 292) now made him extremely reluctant to hazard his own army in a struggle against the Central Powers, especially since the Entente armies had given no convincing proof as yet of their ability to win the war.

THE FIRST RESIGNATION OF PREMIER VENIZELOS. The conflict between the policy of the King and the policy of the cabinet was clearly revealed by the resignation of M. Venizelos in March, 1915. Up to that time, although negotiations for a new Balkan alliance had been rumored, comparatively little information had been vouchsafed the public in respect of the secret negotiations by which the Entente Powers were endeavoring to enlist the active coöperation of Greece against Turkey. The most important statements of policy by M. Venizelos, as head of the Greek government, had been declarations of neutrality. When the Austro-Hungarian armies invading Serbia had taken Belgrade, and the Entente Powers had inquired whether Greece considered herself bound to aid Serbia under the terms of the Serbo-Greek treaty of 1913, Venizelos had affirmed the decision of the Greek government to remain neutral. Just before the Christmas holidays (Old Style), when during the course of the budget debates an Opposition leader, M. Theotokis, had pointed to the recent loan advance of 20,000,000 francs accepted from France as a violation of Greek neutrality, M. Venizelos had again declared that the neutrality of Greece was inviolate. The Anglo-French attack on the Dardanelles forced Greece to reconsider her neutrality. As it afterwards appeared, the Triple Entente was willing to pay a high price for Greek participation in the campaign, and Premier Venizelos of Greece was quite willing to make the bargain. Rumors of an impending decision aroused the liveliest excitement in Greece during the first week of March. Four former premiers of Greece, Theotokis, Ralli, Mavromichalis, and Dragoumis, were called to the palace to consult with the King and the prime minister in a formal Crown Council. Unable to obtain the approval of the King for his policy of intervention, M. Venizelos handed in the resignation of his cabinet, March 6th. M. Zaimis, former Cretan high commissioner, who was recommended by Venizelos as the best man to head a new cabinet, declined to accept the responsibility. Then the King turned

to M. Gounaris, who had been minister of finance in the Theotokis cabinet of 1908. M. Gounaris succeeded in forming a cabinet, March 9th, in which the portfolios were distributed as follows: Premier and minister of war, Gounaris; foreign minister, Christakis Zographos; communications, Baltadjis; instruction, Vozikis; finance, Protopapadakis; interior, Triantafyllakos; national economy, Eutaxias; justice, Isaldaris; marine, Stratas. The declaration of policy issued by the new cabinet, March 10th, contained the significant statement that Greece should "seek the satisfaction of her interests" without "compromising the integrity of her territory." The government officially implied that the outgoing premier had been willing to surrender a portion of Greek territory to Bulgaria, the most bitter foe and rival of Greece. Indignant, and anxious to justify himself before the country, M. Venizelos now made interesting revelations. In an interview with the *Corriere della Sera* March 16th, he admitted that when the Anglo-French operations at the Dardanelles were first undertaken, he had advocated sending Greek troops to aid the Allies, in response to the informal invitation of the Entente Powers. In return, he hoped to gain the vilayet of Smyrna for Greece. This proposal, he asserted, the Crown Council had been too faint-hearted to accept, since it feared that Greece would be exposed to invasion by land. On March 31st M. Venizelos addressed a letter to the foreign minister (M. Zographos); asking the government to deny that the Venizelos cabinet had planned to alienate a portion of Greek territory. Instead of the desired *démenti*, the King sent a letter to M. Venizelos, maintaining that he, M. Venizelos, had, as a matter of fact, proposed the cession of Sari Shaban, Drama, and Kavala in order to bribe Bulgaria to join the Entente Powers in conjunction with Greece. This allegation Venizelos indignantly denied; he had only proposed certain frontier rectifications to be effected only after the conclusion of the war, when Greece would obtain ample compensation—about 140,000 square kilometers in Asia Minor. To substantiate his statements, M. Venizelos published a memorandum which he had submitted to King Constantine on January 24th, communicating the British offer of territory in Asia Minor in return for Greek aid. Greece was asked also to withdraw any objections which she might have to the cession of part of Serbian Macedonia by Serbia to Bulgaria. In his memorandum, M. Venizelos argued that Greece might as a last resort give up Kavala in order to obtain the very desirable ends in view—Smyrna, reconciliation with Bulgaria, and the aid of Bulgaria and Rumania in creating a Greater Greece and in warding off the Austro-German peril. The King, however, had refused to regard the Bulgarian question seriously, and had instructed Venizelos to enter into negotiations with Rumania, disregarding Bulgaria. A second memorandum, which had been submitted to the King on January 30th, was published by M. Venizelos, April 4th. In this document M. Venizelos set forth the contention that inasmuch as Rumania was reluctant to join with Greece and Serbia unless Bulgaria were included in the new Balkan alliance, it would be criminally short-sighted on the part of the Greek government to balk at the cession of Drama, Kavala, and Sari Shaban—only 2000 square kilometers



M. VENIZELOS
 Prime Minister and Minister of Foreign Affairs of Greece
 Resigned October 5, 1915



M. SKOULOUDIS
 Prime Minister and Minister of Foreign Affairs of Greece
 November 7, 1915



M. TAKE JONESCU
 Leader of Conservative-Democratic Party—Rumania



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M. RADOSLAVOFF
 Prime Minister of Bulgaria

FOUR BALKAN STATESMEN PROMINENT IN 1915

in all, inhabited by 30,000 Greeks—when it was possible thereby to gain the friendly coöperation of Bulgaria and Rumania in securing for Greece in Asia Minor over 100,000 square kilometers of territory with a Greek population of about 800,000. According to M. Venizelos's statement, King Constantine withdrew his objections to the cession of Kavala and authorized negotiations with Bulgaria on the lines indicated in the second memorandum. But the announcement that Bulgaria had accepted a loan from German bankers, supervening just at this juncture, upset all the plans of Greece, and convinced M. Venizelos that it would be impossible to gain the coöperation of Bulgaria against the Central Powers and Turkey, even by the offer of territorial concessions. The offer was therefore not made. M. Venizelos further admitted that the Allies had asked Greece to assist Serbia alone, and that Greece had refused, for the reason that the Allies were unwilling to send more than two divisions of infantry to protect Greece against a possible Bulgarian attack. As a counterblast to the ex-premier's revelations, King Constantine issued a *communiqué*, April 6th, flatly denying that he had ever authorized Venizelos to negotiate any agreement which would involve the alienation of Greek territory. The controversy now narrowed itself down to a clear-cut question of fact. M. Venizelos, regarding the royal statement as an impeachment of his own veracity, showed his resentment by absenting himself from the *Te Deum* service, April 7th, when the court celebrated the national holiday of Greece. Venizelos furthermore addressed a letter to the King, threatening to retire from political life entirely, unless the *communiqué* were corrected. The denial was not made, however, nor was the threat fulfilled.

THE RETURN OF VENIZELOS TO POWER. Parliamentary elections were held in June. The government platform promised a long list of important measures, among which may be mentioned: proportional representation, decentralization of public authority, greater economy in public finance, tariff revision, the increase of direct and the reduction of indirect taxation, amelioration of labor conditions, and encouragement of peasant-proprietorship. In respect of foreign policy, the government promised to make no territorial concessions, but to watch for every opportunity to increase the greatness of Greece. In spite of this strong bid for popular support on the part of the Gounaris cabinet, the victory of the Venizelist party was practically a foregone conclusion. Almost 200, out of the total of 316 deputies elected to constitute the new Parliament, were supporters of M. Venizelos. The minister of finance in the Gounaris cabinet having lost his seat in the Chamber of Deputies, resigned his portfolio in the ministry, June 15th. The premier himself delayed his resignation only until the meeting of the newly elected Parliament, which took place August 16th. A fortnight before his resignation, M. Gounaris received a visit from the British, French, Italian, and Russian ministers at Athens, presumably to urge upon Greece the necessity for making concessions to Bulgaria. A few days later M. Gounaris publicly reaffirmed his determination not to cede a single inch to Bulgaria. When M. Gounaris resigned, August 16th, the question arose whether King Constantine would consent to reinstate M. Veni-

zelos as premier, disregarding the recent quarrel. An agreement was reached between the King and the politician, August 22nd, on the basis of (1) benevolent neutrality towards the Entente Powers; (2) fulfillment of treaty obligations toward Serbia; (3) no cession of Greek territory. As a result of this understanding, M. Venizelos was able to resume his post as premier and minister of foreign affairs, August 23rd. His colleagues were as follows: Minister of war, General Danglis; marine, Miaoulis; finance, Repoulis; interior, Gafayris; justice, Raktavin; communications, Diamantidis; public instruction, Tsirimokos; national economy, Michalakopoulos.

THE SECOND RESIGNATION OF VENIZELOS. A new crisis arose in the latter part of September when Bulgaria mobilized against Serbia (see *BULGARIA, History*) and the Greek government was confronted by two problems; first, whether Greece should fulfill her treaty obligations by aiding Serbia against Bulgaria; second, whether Greece should allow Anglo-French troops to pass through Greek territory on their way to fight with the Serbians. On these two points the King and the premier were absolutely disagreed. According to M. Venizelos's own statement (*Corriere della Sera*, November 23rd), the Greek premier acted upon the belief that by persisting in neutrality Greece would not avert, but simply postpone, war with Bulgaria; hence the course of wisdom would be to fight Bulgaria in alliance with Serbia and with the aid of Anglo-French troops. Accordingly, in the latter part of September, M. Venizelos not only ordered Greek mobilization, September 25th, but furthermore asked France and England if they were willing to send 150,000 troops to the support of Serbia. The King, however, refused to consider any such proposition. Venizelos communicated the King's refusal to the Entente Powers. In reply, he received a note from the French minister, October 2nd, announcing that the first contingent of French troops had already arrived at Saloniki, and that other French and English troops would be sent through Greek territory to aid Serbia. "As the *casus foederis* justifying Greek intervention in favor of Serbia had not yet occurred" (as Bulgaria had not yet attacked Serbia), said M. Venizelos, "I protested against the landing of the Anglo-French troops at Saloniki because Greece was still neutral. I could not but be glad however, because I was certain that Bulgaria was on the point of attacking Serbia. . . . On October 5th, however, I was compelled to resign, as the King disapproved what I had done." The text of the Greek protest against the Anglo-French landing at Saloniki was as follows: "In answer to your letter, I have the honor to declare to Your Excellency that, being neutral in the European war, the Royal government (of Greece) could not possibly sanction the proceeding in question, for it constitutes a breach of Greece's neutrality, the more manifest since it comes from two great belligerent Powers. It is therefore the duty of the Royal government to protest against the passage of foreign troops across Greek territory."

THE ZAIMIS CABINET AND THE CYPRUS OFFER. Following the resignation of M. Venizelos, which occurred October 5th, Alexander Zaimis accepted the post of premier and formed a cabinet, October 7th, in which the portfolios were distributed as follows: Foreign affairs, Zaimis; interior,

Gounaris; war, Yanakitsas; marine, Countouriotis; finance, Dragoumis; public instruction, Theotokis; justice and communications, Rhallis. The Zaimis cabinet lasted less than a month, but during its short term of office it decided two important questions. In the first place, when Bulgaria attacked Serbia, October 14th, M. Zaimis refused to involve Greece in the war, and announced that in view of changed circumstances, the Serbo-Greek treaty did not now bind Greece to aid Serbia against Bulgaria. In the second place, the Zaimis government had to consider an offer made by Great Britain, October 17th, whereby in return for active Greek military support, Greece would obtain the important Island of Cyprus from Great Britain. Greece rejected the offer. The Zaimis government never commanded the majority of the Greek Parliament, but existed merely at the will of the King and at the sufferance of M. Venizelos. A violent debate, following a speech which the minister of war chose to regard as a personal insult, led to a vote of no confidence (147-114) and to the resignation of M. Zaimis, November 4th.

THE SKOULLOUDIS CABINET. M. Zaimis was succeeded by a former foreign minister of Greece, M. Skouloudis, who had played a conspicuous part in the London Conference of 1913. The cabinet formed by M. Skouloudis, November 7th, was almost identical with that of his predecessor: Foreign affairs and premier, Skouloudis; public instruction, Micheledkis; justice and communications, Rhallis; interior, Gounaris; national economy, Theotokis; war, Yanakitsas; marine, Countouriotis; finance, Dragoumis. With the Skouloudis cabinet the question was no longer whether Greece should help Serbia—that question had been settled in the negative. The question now was whether the Anglo-French expeditionary forces, and the defeated Serbian armies, should be allowed to operate freely upon Greek territory, instead of being interned, as a strict interpretation of Greek neutrality might require. The whole question is treated in the article **WAR OF THE NATIONS** (q.v.). In this place, it is necessary only to point out that inasmuch as Venizelos still commanded a majority in the Greek Parliament, it was necessary for the King to dissolve Parliament November 11th, in order to forestall a conflict between the ministry and the majority. New elections were called for December 19th. Against this step the Venizelists most strenuously protested. The King was violating the constitution, they claimed, in refusing to recognize the results of the June elections, which had expressed the country's approbation of M. Venizelos and his policies. M. Venizelos therefore announced that he would regard the December elections as unconstitutional, and urged his followers to take no part in the balloting. The result, as might easily have been foreseen, was the return of a majority pledged to support the government. In his political duel with M. Venizelos—for in that way the events of the year may be epitomized—King Constantine had triumphed. Greece had not joined the Entente.

GREENE, EDWARD LEE. An American botanist and educator, died Nov. 10, 1915. He was born in Hopkinton, R. I., in 1843, and graduated from Albion College in 1866. He was an Episcopal clergyman in 1871-85, and then became a Roman Catholic layman. He was professor of

botany at the University of California from 1885 to 1895, and at the Catholic University of America from 1895-1904. In the latter year he was associate in botany at the Smithsonian Institution. His writings include: *Manual of Botany for the Region of San Francisco Bay* (1894), *West American Oaks* (1887), *Pittonia* (5 vols. 1887-1903), *Landmarks of Botanical History* (1909).

GREENLAND. A Danish Arctic colony. Estimated area, 2,200,000 square kilometers (849,420 square miles). Area of settlements (colony proper) 88,100 square kilometers (34,015 square miles). Population of colony proper in 1901, 11,893 (11,621 Eskimos and 272 Europeans); Feb. 1, 1911, 13,459 (13,075 Eskimos and 384 Europeans). In 1912 births and deaths among the Eskimos were 482 and 389 respectively; in 1913, 566 and 377. Trade is restricted to Denmark. Imports from Denmark in 1912 and 1913 were valued at 482,873 and 608,875 kroner respectively; exports to Denmark, 899,451 and 965,802. Principal exports: seal and fish oil, valued in 1912 and 1913 at 490,000 and 467,900 kroner; seal skins, 81,800 and 90,500; blue fox skins, 121,350 and 161,300. The director resides at Copenhagen.

GREGORY, DANIEL SEELYE. An American clergyman and editor, died April 14, 1915. He was born in Carmel, N. Y., in 1832, and graduated from the State Normal College at Albany in 1850 and from Princeton Theological Seminary in 1860. In the following year he was ordained to the Presbyterian ministry, and from then till 1871 served various pastorates. From 1871 to 1878 he was professor of metaphysics, logic, and English literature at the University of Wooster, and was president of Lake Forest University from 1878-86. From 1890-94 he was managing editor of the *Standard Dictionary*. He edited the *Homiletic Review* from 1895-1904, and from that year until his death was general secretary of the Bible League of North America, and managing editor of the *Bible Student and Teacher*. His writings include *Christian Ethics* (1875), *The Crime of Christendom* (1900), and *Constructive Studies in John, the Gospel for the Christian* (1909).

GREGORY, ELIOT. An American artist and writer, died June 1, 1915. He was born in 1854 in New York City and graduated from Yale in 1880. For several years he studied art in Paris, and one of his paintings received honorable mention at the Salon. On his return to New York City he established one of the first studios on the European model. This became a meeting place for artists, musicians, and persons prominent in social life in the city. Mr. Gregory also wrote on a variety of subjects. For many years his *Idler Papers* appeared in the New York *Evening Post*. A number of his essays were gathered into two volumes, *Worldly Ways and By-Ways* and *The Ways of Men*. He was regarded as an authority on art and literary subjects. His work as an artist consisted mostly of portraiture. His portrait of Ada Rehan as "Katherine" in *The Taming of the Shrew*, painted for Augustin Daly, is now in the Shakespeare House in Stratford-on-Avon.

GRENADA. A British West Indian colony, consisting of the Island of Grenada, which is the most southerly of the Windward Islands group, and some of the Grenadines. The area of the island is about 119 square miles; the Grena-

dines have an area of about 14 square miles (Carriacou, the largest, 8467 acres); so that the area of the colony is stated at 133 square miles. At the 1911 census, the population of the colony was 66,750 (6886 in Carriacou); estimate of Dec. 31, 1913, 69,307. The capital and chief town is St. George's (population, 1911, 4916); it has an excellent harbor. About 2 per cent of the inhabitants of the colony are Europeans, almost all the rest being negro. In 1913, there were 30,200 acres under cultivation. Sugar culture is declining, and the cacao is the crop of chief commercial importance. Imports and exports in 1913-14 were valued at £282,927 and £367,149 respectively. Revenue in that year amounted to £91,258 (of which £53,900 from customs); expenditure, £85,827. Public debt, £123,670.

GRENADINES. See GRENADA; and SAINT VINCENT.

GREY, SIR EDWARD. See UNITED STATES AND THE WAR.

GEOTON, WILLIAM MANSFIELD. An American theologian and educator, died May 25, 1915. He was born in Waldoboro, Me., in 1850, and graduated from Harvard University in 1873. He studied theology in the Philadelphia Divinity School, graduating in 1876. In the following year he was ordained a priest of the Protestant Episcopal Church. He was rector of several churches in Canada, Massachusetts, and Rhode Island until 1898, when he became professor of systematic theology in the Divinity School of the Protestant Episcopal Church, in Philadelphia. From 1900 until his death he was dean of that school. He was a member of many important committees at general conventions of his church. In 1912 he was lecturer at Philadelphia on the Bohlen Foundation. He was the editor of the *Sunday School Teacher's Manual* (1909).

GUADELOUPE. A French colony composed of the islands of the Lesser Antilles. Area, 1780 kilometers (687 square miles); population (1911), 212,430. The capital is Basse-Terre. In 1912, imports and exports were valued at 19,524,116 and 26,084,302 francs respectively; in 1913 imports came to 20,174,930 francs (of which 11,196,908 francs represents imports from France) and exports amounted to 18,287,489 francs (of which 16,401,932 francs represents exports to France). The leading exports are cacao, coffee, and sugar.

GUATEMALA. The most northwesterly of the Central American republics. The capital is Guatemala City.

AREA, POPULATION, ETC. The Guatemalan-Honduran boundary has not been entirely fixed, but in the spring of 1915 a treaty was concluded between the two governments looking toward a settlement of the long-standing boundary dispute. On account of the unsettled boundary, the area of Guatemala has been variously stated; one estimate is 48,290 square miles, and another 43,641 square miles. The population, as calculated for the end of 1913, was 2,119,165, as compared with 1,842,134, the figure returned by the census of Dec. 31, 1903. The 1903 census showed about 60 per cent of the population Indian and most of the remainder mestizo. Varying estimates are made for urban populations. Guatemala City, with suburbs, is supposed to have upwards of 100,000 inhabitants; Quezaltenango, 34,000; Cobán, 31,-

000; Totonicapán, 29,000; Esquintla, Zacapa, Chiquimula, and Jalapa, about 18,000 each; Santa Cruz del Quiché, 17,000; Jutiapa, 16,000; Antigua, Salamá, and Huehuetenango, about 15,000 each; Amatitlán, 12,000; Solola, 11,000. The number of births reported for 1913 and 1914 respectively was 75,593 and 76,551; deaths, 38,320 and 40,878; excess of births, 37,273 and 35,673; marriages, 5274 and 5873.

The reported number of public primary schools in 1912 was 1837, with 59,631 pupils; in 1913 pupils numbered 61,136; in 1914, there were 1878 public primary schools, with 64,387 pupils. At the normal schools 343 male and 370 female students were enrolled in 1914. There are a few secondary schools, a medical school, a law school, and several other educational institutions. Roman Catholicism is the prevailing religion. There is no state church.

PRODUCTION AND COMMERCE. Guatemala is a fertile country and produces crops of corn, sugar cane, bananas, cacao, tobacco, etc. Commercially the most important product is coffee. Estimated yield for 1914 is reported as follows in quintals: coffee, 918,522; corn, 4,611,292; wheat, 546,532; rice, 237,523; potatoes, 308,733; beans, 184,426; brown sugar, 100,000. The banana yield was estimated at 7,933,487 bunches. Grazing is of considerable importance; cattle in 1914, 1,407,223. There are valuable forests, in which are worked rubber, chicle, dye woods, cedar and mahogany. Some gold placers are worked, but mining, as well as manufacturing, is little developed.

Imports and exports have been valued as follows:

	1911	1912	1913	1914
Imp.	\$8,166,670	\$9,822,462	\$10,062,828	\$9,831,115
Exp.	\$11,005,835	\$13,156,538	\$14,449,926	\$12,754,027

To the actual invoice value of imports at the maritime customs houses, the Guatemalan authorities add 25 per cent—an estimate covering freights, insurance, commissions, etc. This addition is included in the above import values. In 1912 and 1913 respectively, the principal exports were as follows, values expressed in thousands of dollars: coffee clean, 9126 and 9905; coffee in parchment, 1863 and 2350; bananas, 667 and 826; cattle hides, 190 and 455; sugar, 565 and 349; woods, 241 and 248. The principal countries that have shared in the trade are as follows, in thousands of dollars:

	Imports		Exports	
	1912	1914	1912	1914
United States	5,053	4,879	8,928	4,874
Germany	2,048	1,848	7,654	5,413
United Kingdom	1,650	1,890	1,600	1,477
France	402	818	21	34

COMMUNICATIONS. The reported length of railway in operation in 1914 was 502 miles. San José and Champerico, on the Pacific, have rail connection with Guatemala City, and the latter with Puerto Barrios, on the eastern coast. Connection was made with the Mexican railway system in 1914. Telegraph lines, over 4200 miles; telegraph offices, 236; post offices, about 380.

FINANCE. Revenue and expenditure for the fiscal year 1914 are reported at 82,399,925 and 48,735,805 pesos (paper) respectively. The paper peso fluctuates in value, but is commonly regarded as being worth about six cents. Of

the revenue in 1914, 63,366,454 pesos were derived from customs. Estimated expenditure for the fiscal year 1915, 50,620,617 pesos; for 1916, 60,082,637. The largest disbursement is on account of the public debt, 24,811,744 as estimated for the fiscal year 1916; war, 9,629,826; interior and justice, 6,736,499; public instruction, 6,443,538; public works, 5,305,391; foreign debt, with arrears of interest, £2,357,063.

GOVERNMENT. The legislative power is vested in the National Assembly of 69 members, elected by direct vote for four years, and in the Council of State of 13 members, in part elected by the Assembly and in part appointed by the President. The latter is elected by a direct vote for six years and is assisted by a cabinet of six members. The President in 1915 was Manuel Estrada Cabrera (born 1857), who succeeded to the executive office in March, 1898, and subsequently was elected for terms ending March 15, 1905, 1911, and 1917. There is a first designate and a second designate to act as president in case of the latter's death or disability. On May 11, 1915, the National Assembly elected Ignacio López Andrade as first designate, and Gen. Manuel Duarte as second designate.

HISTORY. In May the National Assembly elected Ignacio López Andrade first Vice-President of the republic and Gen. Manuel Duarte second Vice-President. Presidential elections were to be instituted Jan. 10, 1916. The budget for the fiscal year from July 1, 1915, to June 30, 1916, contemplated a total expenditure of 60,082,640 pesos currency, or \$3,604,958.40. In July a boundary convention was concluded between Guatemala and Honduras. As her delegates to the commission to delimit the boundary, in accordance with the July convention, Guatemala appointed Claudio Urrutia, Felipe Rodriguez, Domingo Conde, Florencio Santizo, Salvador Castillo, and Eugenio Rosal. Marcial Pren was nominated legal adviser to the commission. By the terms of the convention, if the commission should fail to reach a satisfactory settlement, the boundary dispute between the two countries was to be arbitrated by the President of the United States. Early in September a violent earthquake, which was experienced also in several South American countries, caused serious damage to Jutiapa, the capital city of Jutiapa district in Guatemala. An insurrection in the region of San Marco in October failed to achieve more than a local significance. See also **INTERNATIONAL PEACE AND ARBITRATION.**

GUIANA. See **BRITISH GUIANA**; **DUTCH GUIANA**; **FRENCH GUIANA.**

GUILD, CURTIS, JR. An American editor and diplomat, died April 6, 1915. He was born in Boston in 1860. He was educated at Harvard University, where he graduated with the highest honors in 1881. In 1884, after traveling in Europe, he joined the staff of the Boston *Commercial Bulletin*, the property of his father. In 1902 he took entire charge of the paper, which he continued until his death. He began his political career at the age of 21. In 1895 he was elected president of the Republican State Convention and in the following year was prominent as a campaign speaker. He also took an active part in the campaign of 1900 and in 1901 was elected Lieutenant-Governor of Massachusetts. He was elected Governor in 1905 and was reelected for two successive terms. In 1911 he was appointed United States Ambassador to

Russia, serving until 1913. He served with distinction in the Spanish-American War. He contributed occasional articles to magazines and was a member of many patriotic societies.

GULFLIGHT CASE. See **UNITED STATES AND THE WAR.**

GUTHE, KARL EUGEN. An American educator and physicist, died Sep. 11, 1915. He was born in Hanover, Germany, in 1866, and was educated in the universities of Marburg, Strassburg, and Berlin. In 1892 he removed to the United States, and as instructor and assistant professor taught physics at the University of Michigan until 1903. In 1903-05 he was associate physicist in the United States Bureau of Standards, and in 1905-09 professor of physics at the State University of Iowa. In 1909 he became professor of physics at the University of Michigan. From 1912 he was also dean of the graduate department of the university. He was the author of *Manual of Physical Measurements* with J. O. Reed, 1902; *Text Book of Physics* (1908); *College Physics* (with J. O. Reed, 1911); and *Definitions in Physics* (1913). He contributed many papers on physics, particularly on electricity, to different scientific journals. He was a member of many American and foreign scientific societies.

GYMNASTICS. The seventeenth annual intercollegiate gymnastics championships were won by Yale with a score of 22 points. Princeton finished second with 17 points and Pennsylvania third with 9 points. Other scores were: Amherst 7; New York University 5; Columbia 1; Harvard 1; Rutgers 1.

Dual college meets resulted as follows: Yale 35, Princeton 19; Yale 45, Rutgers 9; Yale 35, Pennsylvania 19; United States Naval Academy 41, New York University 10; United States Naval Academy 34, Yale 24; United States Naval Academy 32, Columbia 22; Princeton 33½, Rutgers 14½; Harvard 35, Brown 19; Harvard 42, Dartmouth 12; Pennsylvania 29, New York University 25; Columbia 31, New York University 23; Rutgers 28, Columbia 26; New York University 33, Amherst 21; New York University 33, Rutgers 21.

The club championships of the Amateur Athletic Union held at San Francisco resulted as follows: Rope climb, R. Illing, Olympic Club; tumbling, J. F. Dunn, New York A. C.; club swinging, R. W. Dutcher, New York A. C.; horizontal bar, Franz Kanis, Newark Turn Verein; side horse, J. Oeassy, West Side Y. M. C. A., New York; parallel bars, P. Hol, Norwegian T. and A. C.; flying rings, Otto Paul, National Turn Verein; all-around, Franz Kanis, Newark Turn Verein.

The club point scores follow: Newark Turn Verein 21; Norwegian T. and A. C. 21; New York A. C. 11; Swiss Turn Verein 9; New York Turn Verein 8; West Side Y. M. C. A. 7; National A. C. 5; Grace Club 5; National Turn Verein 3; Rutgers College 2; Harlem Y. M. C. A. 2; Bohemian-American W. G. A. 2; Bohemian Gymnasium Association 1; Ninety-second Street Y. M. H. A. 1.

GYPSY MOTH. See **ENTOMOLOGY.**

HAGGARD, H. RIDER. See **LITERATURE, ENGLISH AND AMERICAN, Fiction.**

HAGUE TRIBUNAL. See **INTERNATIONAL PEACE AND ARBITRATION.**

HAIG, SIR DOUGLAS (1861-). A British soldier. He entered the army in 1885 as a member

of the 7th Hussars. In 1898 he served in the Sudan and was made brevet-major for services in the Atbara and Khartum campaigns. In South Africa he was deputy assistant adjutant-general of cavalry in Natal. In 1900 he became assistant adjutant-general of the cavalry division. He was lieutenant-colonel commander of the 17th Lancers 1901-03; inspector-general of cavalry in India, 1903-06; major-general 1904; director of military training 1906-7; director of staff duties at headquarters 1907-09; chief of staff in India, 1909-12; and general officer commanding at Aldershot 1912-14. When the great war broke out in 1914 he was made lieutenant-colonel of the 1st army corps which went with the British expeditionary force to France. In December he succeeded Sir John French (q.v.) in command of the entire British forces in France. See WAR OF THE NATIONS.

HAÏTI. A republic occupying the western, and smaller, part of the West Indian island of Haiti. Capital, Port-au-Prince.

AREA, POPULATION, ETC. The estimated area is 28,676 square kilometers (11,072 square miles). As compared with most of the other American republics, Haiti is densely populated, though the number of inhabitants cannot be stated with accuracy. An estimate of 1909, based on parish registers, placed the population at about 2,030,000; an estimate for 1912 was 2,500,000, though it is probable that this figure is too high. About 90 per cent of the people are negroes, and most of the remainder mulattoes. City populations are not well known. Port-au-Prince is said to have over 100,000 inhabitants; Cap-Haïtien, about 30,000; Les Cayes, 25,000; Gonaïves, 18,000. There are some 400 national schools, besides a number of private schools, and five lycées. Elementary instruction has been nominally compulsory since 1910, but the educational system is very imperfect, and illiteracy prevails. The people speak a French patois and profess Roman Catholicism.

PRODUCTION, COMMERCE, ETC. The most important crop commercially is coffee; other crops are cacao, sugar cane, tobacco, and cotton. Valuable woods, especially logwood, are cut for export. There are several sugar mills, and rum and other spirits are distilled. The mineral resources are not unimportant, but mining is almost entirely undeveloped.

For foreign commerce, the latest figures available are those for the fiscal year 1913, when imports were valued at \$8,100,125, and exports at \$11,315,539; imports and exports in the fiscal year 1912, \$9,876,555 and \$17,285,485. For 1913 the total coffee export was reported at 56,962,000 pounds; cotton, 4,266,000 pounds; cacao, 3,898,000 pounds; cotton seed, 7,922,000 pounds; honey, 1,231,000 pounds. The share of the principal countries in the trade has been estimated as follows, in thousands of dollars:

	Imports		Exports	
	1912	1913	1912	1913
United States	7,302	5,909	1,100	1,000
France	1,053	817	8,500	5,000
United Kingdom	761	593	1,800	800
Germany	485	536	6,100	4,200

Vessels entered at the ports in 1914, 871 steamers, of 1,747,827 tons, and 35 sail, of 23,719 tons. There are about 225 kilometers (140 miles) of railway, including light railway. Tel-

egraph line (1910), 124 miles; post offices (1911), 88.

FINANCE. The greater part of the revenue is derived from customs. Duties on both imports and exports are payable in American gold. The paper gourde, nominally equivalent to about 96.5 cents, is current at about one-fourth its face value. For the fiscal year 1914, the estimated revenue was \$5,078,754 and 4,898,680 gourdes; estimated expenditure, \$3,904,291 and 9,095,000 gourdes. Estimated revenue for 1915, \$4,980,147 and 4,959,386 gourdes; estimated expenditure, \$4,847,385 and 8,777,627 gourdes. By far the largest item of expenditure is service of the debt, estimated for the fiscal year 1915 at \$4,007,147 and 149,000 gourdes. Public debt, July 1, 1914, \$25,892,181 and 13,534,812 gourdes.

GOVERNMENT. The legislative power is vested in a National Assembly of two chambers, the Senate and the Chamber of the Communes. Members of the lower house (96 in number) are elected by direct vote for three years. Senators are elected for six years by the Chamber of the Communes from a list prepared partly by the President of the republic and partly by the electors. According to the constitution, the President is elected for seven years by the two chambers in joint session. Haitian presidents, however, seem unable to serve out their term. An account of recent revolutionary movements is given below. On Aug. 12, 1915, Philippe Sudre Dartiguenave, a senator, was elected President; he was recognized by the American government on September 17th following.

HISTORY. *The Guillaume Revolution.* After the two successive revolutions of 1914, which established first Oreste Zamor and then Davilmar Théodore as president of the turbulent republic, Haiti was again plunged into civil war by the outbreak of a third revolution in January, 1915. The leader of the new movement was Gen. Vilbrun Guillaume Sam, who turned traitor to the Théodore government about the middle of January and enlisted the support of various professional insurgents. He took possession of the important town of Cap Haïtien, January 16, after General Metallus, who was loyal to President Théodore, had evacuated the place. Encouraged by this early success, Guillaume began an energetic campaign, capturing Plaines, Trou Ounamenthes, Fort Liberté, and Limonade. His next attack was directed against Port-au-Prince, the capital and principal seaport of Haiti. His troops easily captured the city, and Guillaume announced the success of his revolution by proclaiming himself President of the republic. President Théodore, completely defeated and discredited, took refuge upon a Dutch vessel in the harbor of Port-au-Prince. With Guillaume's victorious army in possession of the capital and Théodore a fugitive, the National Assembly was easily persuaded to proclaim Guillaume provisional President of the republic. No sooner had General Guillaume established himself in the presidency than he was confronted by a counter-revolution, for ex-President Oreste Zamor, who had ingloriously fled the country in 1914, now returned to harass the new government. Zamor's forces, however, were easily defeated in a battle near Hinche, March 13, and the gallant soldier of fortune was himself taken prisoner. While General Zamor, after his unsuccessful revolt, languished in the prison

at Port-au-Prince, early in April a fresh rebellion against President Guillaume was prepared by Gen. Rosalvo Bobo, a former minister of Haiti to the Dominican Republic. Cap Haitien, and Trou, and Fort Liberté quickly succumbed to rebel attacks. Grande Rivière and Limbe were captured several times by General Bobo's forces, but retaken as frequently by the presidential troops.

Financial Difficulties with the United States. The distressing political situation in Haiti was complicated by the operation of foreign financial interests. In the YEAR BOOK for 1914, mention was made of the difficulties encountered by the Haitian government with its French, German, and British creditors, and of the fact that the National Bank of Haiti had transferred a large government gold deposit from Haiti to New York City, much to the chagrin of President Théodore. Consequently, in January, 1915, President Théodore closed up the National Bank and established a new bank in its stead. The officials of the old bank raised strenuous protests. Their protests, it is interesting to note, were seconded by the American minister to Haiti. In February the interest taken by the United States government in Haitian financial questions was even more clearly manifested, when President Wilson sent ex-Governor Fort of New Jersey to Haiti with instructions to strive to bring about better relations between Haiti and the United States, and to settle the financial difficulties. When ex-Governor Fort's mission proved futile, President Wilson in April appointed a new representative, Mr. Paul Fuller, to act as the United States' representative in securing a satisfactory settlement of Haitian financial affairs. At the same time, American bankers refused to extend any credit to Haiti unless the prompt payment of interest and sinking fund charges could be guaranteed. President Guillaume was informed that in order to obtain the funds of which he stood in sore need, he would have to turn over the administration of the Haitian customs houses to United States officials. In spite of his necessity, and in disregard of Mr. Fuller's plausible arguments, President Guillaume absolutely refused to make the desired arrangement, which would have been equivalent to making his country a financial protectorate of the United States. In his defiance of the United States, he was supposed to have the support of Haiti's French and German creditors, who presumably would be reluctant to have the Haitian customs revenues pass into American hands.

Assassination of President Guillaume. Notwithstanding his financial perplexities, President Guillaume succeeded in crushing the rebellions instigated against him. In May his troops, with the support of government gunboats, recaptured Cap Haitien and several smaller places, forcing General Bobo to flee to Trou. In July another revolutionary band under Gen. Quartier Morin was defeated and dispersed, and the railway between Cap Haitien and Grande Rivière could be opened to traffic for the first time since April. By casting his rivals and opponents into prison, and by the employment of dictatorial methods, President Guillaume sought still further to enhance his own power. But a new rebellion was already brewing. Tales of the cruel treatment of political prisoners filled the populace of Port-au-Prince with horror.

The climax came in August, when General Oscar, governor of Port-au-Prince, and an associate of Guillaume, massacred 160 political prisoners, including that Oreste Zamor whose unsuccessful attempt at insurrection has already received notice. The massacre was immediately followed by a popular uprising in Port-au-Prince. The palaces of Oscar and Guillaume were captured by mobs. Both Oscar and Guillaume were shot down, and their bodies dragged through the streets of Port-au-Prince. Gen. Sudre Dartiguenave, president of the Senate, was elected by the National Assembly to act as provisional President of the republic.

American Intervention in Haiti. The failure of Mr. Fuller's mission and the continuance of chaotic political conditions in Haiti convinced the United States government that armed intervention was necessary in order properly to protect American interests. Consequently, in June Rear Admiral Caperton was ordered to proceed with the armored cruiser *Washington* from Vera Cruz to Cap Haitien to relieve the French cruiser *Descartes* which had been keeping order. In July American marines, in attempting to land at Port-au-Prince, were attacked by natives. In the ensuing skirmish two marines and six natives were killed. Rear Admiral Caperton attempted in August to bring about an end of the many revolutions by sending a commission to the leading revolutionary chiefs. General Blot agreed to withdraw from the conflict, but General Bobo rejected the proposal. On August 5th marines from the battleship *Connecticut*, which had been ordered to Haiti, took possession of the fort dominating the city of Port-au-Prince. This action brought about resistance from the Haitians, with the result that one native was killed. Three days later Rear Admiral Caperton took over the administration of the customs house of the capital. The rioting which followed the election of General Dartiguenave as president of the republic (*supra*) made it necessary to place Cap Haitien under martial law and to send a force of American marines also to occupy St. Mare. A week later the Americans entered Port de Paix, a town of 10,000 inhabitants situated northwest of Cap Haitien. Late in August the announcement was made that the United States had asked Haiti to accept without delay the draft of a convention which undertook to establish an effective control of Haitian finances by the United States. On September 16th this convention was signed by both parties. It provided for (1) the establishment of a Haitian receivership of customs under American control; (2) the establishment of a native constabulary force under the command of American officers; (3) the establishment of American control over the finances of Haiti to an extent necessary to safeguard the interests of the Haitian people and of their foreign creditors; and (4) a term of 10 years during which the treaty was to remain in force, with the possibility of extending it at the expiration of that period if either of the signatories should so desire. Meanwhile, without waiting for the signature of the convention, the American forces which had landed in Haiti had already assumed control of the Haitian customs houses, and Paymasters Rogers and Van Patten were appointed collector of customs and captain of the port, respectively. Frequent skirmishes between the American marines and the Haitian insurgents were reported

throughout September and October. Near Gonaïves, September 19, an engagement was fought in which 2 Americans and 16 Haitians were killed. Near Cap-Haïtien, September 26, a more sanguinary battle was fought, in the course of which 40 Haitians and 1 American were killed and 10 Americans were wounded. Two of the Haitian leaders, General Pétion and General Morency, entered into peace agreements with the American commander, September 29 and October 1. All effective opposition having been extinguished by the American landing party, the agreement recently negotiated could now be ratified by the Haitian House of Representatives, the first week in October. The Haitian Senate signified its approval of the treaty a little more than a month later, November 12. It then only remained for the United States Senate to ratify the treaty in order to complete the formal ratification of the virtual protectorate which had already been established by force of arms. By the middle of November the last sparks of insurrection were reported to have been stamped out, and Pres. Sudre Dartiguenave, thanks to American support, enjoyed the unique distinction of maintaining order in the republic. The government of President Dartiguenave had received formal recognition from the United States in September; France, however, withheld recognition until the President consented, November 25, to offer formal apologies for an attack which had been made on the French legation at the time of Guillaume's overthrow.

For further details regarding the American intervention in Haiti, see UNITED STATES, *Foreign Relations*.

HALIFAX. See DOCKS AND HARBORS.

HALL EXPLORATIONS. See EXPLORATIONS, *Asia*.

HALL OF FAME. An election for additional members to the Hall of Fame at New York University was held in 1915. Of the 212 nominees proposed by the public 179 were men and 33 women. In the election held in September the 97 electors chose nine names as follows and by the vote indicated: Alexander Hamilton, 70; Mark Hopkins, 69; Francis Parkman, 68; Elias Howe, 61; Joseph Henry, 56; Rufus Choate, 52; Daniel Boone, 52; Charlotte Cushman, 53; Louis Agassiz. Hamilton and Agassiz had been elected in 1905 to a separate hall instituted for notable foreign born Americans. In 1914 it was decided to do away with this discrimination. John Paul Jones and Roger Williams had also been elected to the hall for foreign-born, but they failed of reelection, when Hamilton and Agassiz were successful. However, they remained in nomination for the year 1920. The total number of names admitted in the four elections thus far held include those of 50 men and of 6 women.

HAMILTON COLLEGE. An institution for higher education at Clinton, N. Y. The total enrollment in all departments in the autumn of 1915 was 189. The faculty numbered 29. There were no notable changes in the membership of the faculty during the year. Several small benefactions were received. The productive funds at the close of the fiscal year 1915 amounted to \$1,100,000. In the library were 67,000 volumes.

HAMPTON NORMAL AND AGRICULTURAL INSTITUTE. An institution for the

higher education of negroes, at Hampton, Va. The total number of students in all departments, including the primary day school and summer school, in the autumn of 1915 was 1780. The faculty numbered 130. The productive funds for the fiscal year ending June 30, 1915, amounted to \$2,835,304. The total receipts from all sources for the same period \$478,735. The library contained 35,419 volumes. During the year Mayor Richard Moton, who had been identified with Hampton, was chosen to head Tuskegee Institute in succession to Dr. Booker T. Washington.

HANDBURY, THOMAS HENRY. An American soldier, died April 23, 1915. He was born in Pennsylvania, and graduated from West Point in 1865. In the same year he was appointed second lieutenant in the artillery, but was transferred to the engineering corps in 1866 as first lieutenant. He served in San Francisco until 1872, when he was detailed to West Point as assistant professor of engineering, remaining there until 1876. From 1883-88 he was engineering officer of the division of Missouri, and from 1888-93 was in charge of the improvements in the mouth of the Columbia River. He was superintending engineer of the Mississippi River improvements from the mouth of the Missouri to the mouth of the Ohio, from 1896-99. In 1905 he was promoted to colonel, and was retired.

HARBORS. See DOCKS AND HARBORS.

HARDIE, JAMES KEIR. An English labor leader, and member of Parliament, died Sept. 26, 1915. He was born in Scotland in 1856, and at the age of seven was put to work in the mines as helper. He continued to earn his living in the mines until he was twenty-four years old. In his spare moments he studied diligently, and early became impressed with the necessity of doing something for the working classes. While still a workman he took an active part in the organization of mining labor, and was elected secretary to the Lanarkshire Miners Union. In 1882 he was appointed an editor of the *Cummock News*, and continued in that capacity until 1886. In that year he went actively into politics, and in 1888 became the Labor candidate for Mid-Lanark. He was elected to the House of Commons in 1892, was defeated in 1895, and returned in 1900, from Wales. He became one of the most notable leaders in the labor movement, and visited the United States in 1895, and again in 1908. He returned the following year, and three years later made a tour of the United States and Canada. Mr. Hardie was a Socialist, and was violently opposed to war. On Aug. 2, 1914, he delivered a speech in Trafalgar Square, London, in which he demanded that Great Britain remain neutral. He called upon the working men of the world to use their influence, industrial and political, to stop the war. On Aug. 27, 1914, he caused a bitter demonstration in the House of Commons when he attempted to cross-examine Sir Edward Grey, concerning the negotiations then being carried on. On Feb. 14, 1915, Hardie was one of the 40 Socialist leaders who met in London to discuss the attitude of Socialists during the war. The resolution was then adopted concerning the right and duty of the nation to defend itself from attack. In 1907 he made visits to India and Australia. He was the founder of the *Labor Leader*, a frequent contributor to magazines and reviews, and chair-

man of the Independent Labor Party. Hardie was one of the most interesting and picturesque figures in British public life for more than 25 years. As a Socialist leader of the Labor Party in the House of Commons he acquired wide fame.

HARDY, JOSEPH JOHNSON. An American educator, died May 2, 1915. He was born in New Castle, England, in 1844, was brought to the United States by his parents in 1846, and graduated from Lafayette College in 1870. In 1891 he became professor of mathematics and astronomy in that college and held this position until his death. He was the author of *Analytical Geometry, Infinitesimals and Limits*.

HARRIS, ANDREW LINTER. An American government official, former Governor of Ohio, died Sep. 13, 1915. He was born in Butler County, Ohio, in 1835, and graduated from Miami University in 1860. He was appointed second lieutenant in the 20th Ohio infantry in 1861, and served throughout the war, rising to the rank of brigadier-general of volunteers. In 1865 he was admitted to the bar, and from 1875 to 1882 was probate judge of Preble County. He was a member of the Ohio Senate from 1865-67, of the House of Representatives 1885-89, lieutenant-governor of Ohio from 1892-96. He was a member of the United States Industrial Convention from 1898-1902, and from 1906-09 was Governor of Ohio. He was a member of several patriotic societies.

HARRISON LAW (NARCOTIC LAW). Enacted on Dec. 17, 1914, the Harrison Federal Law went into effect on March 1, 1915. It obliges every distributor of opium, morphine, chloral, or other narcotics to pay a special tax to the local collector of internal revenue, and display prominently a special license. Records must be kept by the druggist or dealer, or the physician who dispenses the narcotic, stating how much was dispensed, for what person, and under what physician's order, under severe penalties for neglect. These records must at all times be open to irregular calls of an inspector. Noticeable lessening of the use of narcotics has been the result, and the number of addicts seeking relief from the sufferings of rapid withdrawal is already decreasing.

HARVARD UNIVERSITY. The total enrollment in all departments in the autumn of 1915 was 5699. The faculty numbered 859. The university received in April, \$100,000 by the will of James J. Myers, of Cambridge. The Widener Memorial Library, erected in memory of Harry Elkins Widener, was dedicated on June 24th. This library ranks third in capacity among the libraries of the country. On October 4th gifts amounting to \$155,601 were announced, and on October 27th gifts amounting to \$142,000 and including \$125,000 given by James J. Hill were announced. The total productive funds at the end of the collegiate year 1914-15 amounted to \$25,448,701. The annual income was about \$3,000,000. For further notice in regard to the university, see UNIVERSITIES AND COLLEGES.

HAUPTMANN, GERHART.—PERFORMANCE OF "THE WEAVERS" IN ENGLISH. See DRAMA, AMERICAN AND ENGLISH.

HAWAII. POPULATION. The estimated population of the Hawaiian Islands on June 30, 1915, was 232,856, which includes 9600 soldiers and officers of the army and navy. The Orientals numbered 136,626. Native full blooded

Hawaiians continued to decrease. The total number of births was 8507, an increase of 1751 over 1914. The total number of deaths was 3556, a decrease of 151 from the previous year.

INDUSTRIAL CONDITIONS. The year 1915 was one of unusual prosperity. A greater quantity of sugar was produced than in 1914 and the financial returns from this staple were greater. The second commodity in importance as regards production and gross value was canned pineapple.

COMMERCE. The total imports from the United States for the fiscal year 1915 amounted to \$20,295,829. Of this \$11,799,316 represents manufactures ready for consumption. The shipments from Hawaii to the United States amounted to \$60,610,935; of this \$59,345,247 represents food-stuffs. The total value of the sugar exported to the United States was \$52,959,697. Canned pineapple amounted in value to \$5,986,198, and the total of fruits and nuts to \$6,189,203.

EDUCATION. The number of school children increased 3241 in 1915, making a total of 36,529. The school accommodations under the bungalow system of buildings so well adapted to the climate and financial resources are rapidly supplying the demand for room for the marked increase of pupils.

FINANCE. The assessments of property increased \$15,413,996 over 1914, making a total of \$176,401,222. The total revenue collected by the Territory and countries aggregated \$4,691,831. Of this \$2,557,675 was set aside by law for the county governments, and \$2,134,156 remained for territorial expenditure; \$3,162,148 was available for the Territory from current revenues and \$2,747,270 was expended, leaving a net cash balance at the close of the year of \$414,878. The bonded indebtedness of the territory was increased during the year by the sale of \$1,179,500 of 4 per cent public improvement bonds, issued in 1914, and was decreased by the payment of \$150,000 of 4½ per cent public improvement bonds.

PUBLIC HEALTH. The general health conditions in the islands were better during the year than during 1913 and 1914. At the last session of the Legislature a number of new laws relating to public health were passed and some amended. Provision was made for the care, control, and treatment of persons addicted to the excessive use of drugs or liquor.

PUBLIC WORKS. Public works were energetically pushed forward during the year, particularly wharves and water-front improvements. Nearly every island port had some attention. The construction of a modern prison was commenced during the year. Plans for material enlargement of Honolulu harbor were made but the necessary appropriations had not been made by Congress. Extensive wharf improvements are being entered upon by Honolulu.

Work was renewed on the great naval dry-dock, which was begun in July, 1909, in the early part of 1915. Owing to the great pressure through the porous coral reef on which the dock is built, the bottom heaved upward on Feb. 17, 1913, and work ceased at that time. New plans were adopted, and the dock will be much larger than originally designed. The new dimensions are 1029 feet long, 148 feet wide at the top, and 35 feet of water on the sills. The total cost under new contract will be \$4,442,152. The date for completion is July 1, 1918.

HAWAWEENY, RAPHAEL. A bishop of

the Syrian-Greek Orthodox Church, died Feb. 27, 1915. He was born in Damascus and graduated from the Syrian Greek Orthodox School in 1870. In 1876 he was ordained a deacon and the following year having become a priest was made abbot of St. Ignatius in Moscow. In 1893 he was appointed lecturer of the Arabic language at Kazan. He removed to the United States in 1895 as the head of the Syrian Greek Orthodox Mission of North America, and in 1904 was made bishop of North and South America, which position he held until his death.

HAY. Data on the production of hay in 1915 were available only for the United States, which produced the largest crop in its history. The production, according to estimates by the Department of Agriculture, amounted to 85,225,000 tons, which was 12,534,000 tons above the next largest crop—produced in 1912. An area of 50,872,000 acres was devoted to the crop, and while this was quite large, exceeding the area of the preceding year by more than 1,500,000 acres and the average area for the five-year period, 1909–13, by over 1,000,000 acres, it was surpassed in several previous years. The average yield of 1.68 tons per acre also constituted a record and was one-fourth of a ton above the acre yield for 1914 and over one-third of a ton above the acre yield for the five-year period 1909–13. Although the farm value on December 1, \$10.70 per ton, was 42 cents under the corresponding value the year before and \$1.43 under the same value for the five-year period above mentioned, the total value of the crop estimated on this basis stood unsurpassed and amounted to \$912,320,000. Estimates published by the Department of Agriculture during the year place the area of wild hay, or hay made from the natural grasses growing on uncultivated lands, cut in the North Central States west of the Mississippi, at 12,675,000 acres, 523,000 acres more than the tame hay in those States and almost three-fourths of the estimated total of approximately 17,000,000 acres of wild hay cut in the entire country. The same authority published estimates pointing out that in addition to the hay fed to the live stock of the country about 55 per cent of the estimated annual production of 120,000,000 tons of straw of wheat, oats, barley, rye, rice, flax, and buckwheat are used for feeding purposes. See also AGRICULTURE.

HAY, JOHN. See LITERATURE, ENGLISH AND AMERICAN, *History*.

HAZELTINE, GEORGE. An American lawyer and editor, died Sept. 9, 1915. He was born in Bradford, Mass., in 1829, and graduated from Dartmouth College in 1854. In 1862 he removed to London where he was for a time editor of the *London American*. He then began the practice of law in that city, and for several years was one of the best known lawyers in London, taking part in the trial of many important cases on letters patent before the King's bench. In 1876 he returned to New York, and became senior member of a patent firm under the name of Hazeltine and Co. He was for many years one of the leading patent lawyers of the world, and was largely responsible for the present patent laws of Germany. He was an intimate friend of President Lincoln, and other prominent men of that time. He received the degree of LL.D. from the University of Chicago and the University of Albany.

HEALTH. See HYGIENE.

HEALTH RESORTS. See HYDROTHERAPY.

HEARN, LAFCADIO. See LITERATURE, ENGLISH AND AMERICAN, *Essays*.

HEIDENSTAM, VERNER VON. A Swedish scientist, who in 1915 received a third of the Nobel Prize for literary work. Born in 1859, his earliest tastes were for painting, which he adopted as a profession, but was obliged to give up on account of ill health. After spending some time in traveling abroad he returned to Sweden, took up his residence in Stockholm, and devoted himself to writing. His first work, published in 1888, was called *Vallfart och Vandringar*. Its merits brought him into the front rank of Swedish poets. This volume was followed by a book on travel entitled *From the Col di Tenda to Blocksberg*, and this was followed in 1889 by a novel called *Endymion*. In 1892 appeared the novel by which his name and literary style are best known. It is entitled *Hans Alienus*, and is partly allegorical and partly biographical. With this book Heidenstam took his place in the new school of high intellectual thought and conservative tendencies. He published other books, including poems, novels, and essays. These include *Charles XII and His Wars*, published in 1897–98. This indicated the beginning of the interest in Swedish national life and history, which has given Heidenstam wide popularity wherever the Swedish language is read or spoken, and was chiefly instrumental in bringing him the Nobel Prize. Other works include *Tankar Och Techningar* (1899); *St. George and the Dragon* (a collection of sketches, 1900); *The Pilgrimage of the Holy Bridget* (1901); *Classicism and Teutonism* (1901); *Folkungatradet* (a Viking novel, 1905); *Dagar Och Handlingar* (1909); *Svenskarna Och Deras Hordingar* (1909); *Proletar-Filosofien Upplosging Och Fall* (1911); and *Stridskiften* (1912).

HELL GATE BRIDGE. See BRIDGES.

HELIOOTHERAPY. See TUBERCULOSIS.

HENDERSON, CHARLES RICHMOND. An American sociologist and educator, died March 29, 1915. He was born in Covington, Ind., in 1848. He graduated from the University of Chicago in 1870, and studied at the Baptist Union Theological Seminary. In 1873 he was ordained to the Baptist ministry, and served in pastorates in Terre Haute, Ind., and Detroit. In 1892 he was appointed assistant professor of sociology and university recorder at the University of Chicago. He became associate professor in 1894, and professor of sociology in 1897. From 1904 until his death he was the head of the department of practical sociology. He was associate editor of the *American Journal of Theology*, *American Journal of Sociology*, and the *Journal of the American Institute of Criminal Law and Criminology*. He held office at many conferences of charities and corrections in the United States and abroad, and was a member of many associations. He received a Ph.D. from Leipzig in 1901. His published writings include *Introduction to Study of Dependent, Defective and Delinquent Classes* (1893–1901), *Development of Doctrine in the Epistles* (1894), *The Social Spirit in America* (1896), *Social Settlements* (1897), *Social Elements* (1898). He also edited important volumes relating to social subjects.

HENSEL, WILLIAM UHLER. An American lawyer and educator, died Feb. 27, 1915. He was born at Quarryville, Pa., in 1851, and in 1870 graduated from Franklin and Marshall Col-

lege. In 1873 he was admitted to the bar, and in 1891 was appointed attorney-general to the State of Pennsylvania, holding this position until 1895. He was prominent in politics, being chairman of the State Democratic Committee 1882-87, and delegate to many Democratic national conventions. He received the degrees of LL.D. from Dickinson College, Washington and Lee College, and Litt.D. from Franklin and Marshall College in 1912, and was a member of several learned societies.

HEREDITY. See *EUGENICS, passim*; and *IN-SANITY*.

HERRESHOFF, JOHN BROWN. An American yacht designer, died July 20, 1915. He was born in 1841 in Bristol, R. I. As a result of an accident when he was 15 years of age he became totally blind. In spite of this he established a ship-yard and built several small craft which were noted for their speed. In 1873 with his brother, Nathaniel Green Herreshoff, he began to design and build steam vessels and steam launches. In 1893 the brothers designed and built the cup defender *Vigilant*, and from that time they constructed every yacht built to defend the *America's* cup. These include the *Defender*, *Columbia*, *Reliance*, and *Resolute*. The last named was built in 1914.

HERVIEU, PAUL ERNEST. A French dramatist, died Oct. 25, 1915. He was born in 1857, at Neuilly-sur-Seine, just outside the city of Paris, and was educated at Lycée Condorcet and the Ecole de Droit, in Paris. He studied law and began practice in 1877. Soon afterwards he entered the diplomatic service and was appointed secretary to the French legation in Mexico. He resigned this post in 1880 to devote his talents to literary work. His first publication was a series of political, social, and satiric sketches. His first play, *Les paroles restent*, was produced in Paris in 1892. This was followed by *Les tenailles* (1895), *La loi de l'homme* (1897), *Point de lendemain* (1901), *L'énigme* (1901), *Théroigne de Mericourt* (1902), *Le dédale* (1903), *Le réveil* (1905), *Connais-toi* (1909), *Bagatelle* (1912), and *Le destin est maître*, which last was produced at the Théâtre Port Saint-Martin, Paris, in 1914. His masterpiece is generally considered to be *La course du flambeau*, which was produced in Paris in 1900. His dramas were nearly all intended to illustrate some philosophical point in which he was at the time especially interested, and many of them attacked the divorce laws of France. Hervieu was a prolific writer of short stories, and one of the most successful of contemporary playwrights, the greater number of his works being produced by actors of wide reputation. In 1913 M. Hervieu, angered by criticisms published in *L'Action Française*, challenged its editor, Leon Daudet, to a duel. They exchanged four shots, none of which took effect, and shortly after this a reconciliation was effected by their friends. M. Hervieu was a member of the French Academy, a grand officer of the Legion of Honor, and was for many years president of the Society of Authors. See also *FRENCH LITERATURE, Literary Events*.

HERZEGOVINA, THE. See *AUSTRIA-HUNGARY*; and *BOSNIA AND HERZEGOVINA*.

HESPERIAN CASE. See *UNITED STATES AND THE WAR*.

HESSE. See *GERMANY*.

HEWETTITE. See *MINERALOGY*.

HEWLETT, MAURICE. See *LITERATURE, ENGLISH AND AMERICAN, Fiction*.

HEYWOOD, CHARLES. An American officer of the marine corps, died Feb. 26, 1915. He was born in Waterville, Me., in 1839. In 1858 he was appointed second lieutenant and two years later became captain. His first service was in quelling quarantine riots in Staten Island, N. Y., in 1868. Later he was on special service taking captured negroes back to Africa. He served on the United States battleship *Cumberland* from September, 1860, until she was sunk by the *Merimao* in 1862. He took part in the battle of Hatteras Inlet, and in the capture of Forts Hatteras and Clark. During the battle of Mobile Bay he was on the *Hartford*, and was also present at the capture of Forts Gaines, Morgan, and Powell. He was brevetted major and lieutenant-colonel for distinguished gallantry. After the war he commanded battalions of marines at Baltimore, Philadelphia, and Reading during labor riots. In 1885 he organized and equipped a battalion to open transit and protect American lives and property at Panama. From 1891 to 1903 he was commandant of United States marine corps, and in the latter year he was retired with the rank of major-general.

HIDES. See *LEATHER*.

HIGH COST OF LIVING. See *FOOD AND NUTRITION*.

HIGH PRESSURE FIRE SYSTEMS. See *FIRE PROTECTION*.

HIGH SCHOOLS. See *EDUCATION IN THE UNITED STATES*.

HINDENBURG, PAUL VON BENECKENDORF UND VON (1847—). A German soldier born in Posen. He entered the army in 1866 and served in the war against Austria in that year, and in the Franco-Prussian War in 1870-71. He distinguished himself at Königgratz in the former, and at St. Privat and the battle of Sedan in the latter. He received a military education (1872-75) and served on the General Staff and as head of the War Department. He became major-general in 1900 and lieutenant-colonel in 1903. In 1911 he was retired, but at the outbreak of the great war in 1914 was recalled and given chief command of the campaign against Russia. At Tannenberg he won a great victory over the Russians. In 1870 and 1914 he was decorated with the Iron Cross, and in the latter year was made a field marshal. He commanded the great drive into Russia, in 1915, which conquered Poland and threatened Riga and the Black Sea ports. See *WAR OF THE NATIONS*.

HISTAMINE HYDROCHLORIDE. This substance has a powerful contractile action on certain muscular fibres, as well as a strong vasoconstrictor action. It was first prepared synthetically by Windaus and Vogt in 1907, and was isolated from ergot in 1910 by Kutscher, Barger, and Dale. The drug is a valuable reagent for the standardization of pituitary and similar preparations, but has not yet been recommended for therapeutic use in place of pituitary extract, in spite of its similarity in physiologic action.

HISTORICAL ASSOCIATION. AMERICAN. The Association held a special session in July, 1915, at the Panama-Pacific Historical Congress in California. The papers read there dealt with the history of Spanish-American States, the Pacific States, British Columbia, Alaska,

Japan, Philippines, and Australasia in their respective relations with the Pacific Ocean. President H. Morse Stephens gave an address on the "Conflict of the European Nations in the Pacific Ocean." The regular annual meeting, held at Washington on Dec. 27-31, 1915, was exceptionally well attended on account of the interest aroused by a controversy as to the relationship between the Association and its official publication, *The American Historical Review*. After a report by Prof. Edward P. Cheyney a vote of confidence was given to the editors of the *Review*. A large number of excellent papers were read at the meeting. Three sessions were devoted to the topic of nationalism, and in his presidential address Professor Stephens placed special emphasis on the criminal responsibility of nationalistic historians. The session on ancient history was devoted to "Economic Causes of International Rivalries and Wars in Ancient Times." Another session discussed mediæval colonization, and in the American history session Prof. William I. Hull discussed the Monroe Doctrine as applied to Mexico, and Sen. Albert J. Beveridge described some interesting traits of character of John Marshall. The meeting also gave further impetus to the movement for a Federal Archives Building. The following officers were elected at the annual meeting: President, G. L. Burr; first vice-president, Worthington C. Ford; second vice-president, William Roscoe Thayer. The council consists of E. C. Barker, G. S. Ford, C. H. Haskins, U. B. Phillips, Lucy M. Salmon, and S. B. Harding. J. Franklin Jameson is managing editor of the *Review*. The present membership of the American Historical Association is about 3000.

HISTORY. For noteworthy historical works of the year, see historical sections of articles referred to under LITERATURE.

HOCKEY. The St. Nicholas Skating Club of New York City for the second successive year won the championship of the American Amateur Hockey League, but only after a hard fight with the Boston A. A. seven, a newcomer in the organization. St. Nicholas scored 7 victories as against 1 defeat, while Boston won 6 games and lost 2. The standing of the other teams was: Hockey Club of New York, won 3, lost 5; Crescent A. C., won 3, lost 5; Irish-American A. C., won 1, lost 7. Games between American and Canadian teams resulted as follows: St. Nicholas S. C. 3, Toronto Argonauts 2; St. Nicholas S. C. 4, Queens University 1; St. Nicholas S. C. 5, St. Michaels, Toronto, 1; Ottawa University 7, Crescent A. C. 3; Ottawa University 8, Boston A. A. 2. The Wanderers of Ottawa won the championship of Canada by defeating Montreal in the final game. The score was 4 to 1. The Wanderers of Montreal vanquished Quebec in a series of professional matches played in New York City. The inter-collegiate championship was won by Princeton for the third year in succession. Harvard was second and Yale third.

HOEBER, ARTHUR. An American painter and art critic, died April 29, 1915. He was born in New York in 1854 and educated in the public schools of that city. He studied at the Art Students' League, and afterwards in Paris under Gerôme. He contributed to several exhibitions in Paris, and then returned to the United States where he contributed to Amer-

ican exhibitions. He engaged in writing and lecturing on art, and was for three years art critic of the *New York Times*. At the time of his death he was art critic of the *Globe and Commercial Advertiser*. He was an associate member of the National Academy of Design, and was the author of *Treasures of the Metropolitan Museum of Art*, and *Painting in the Nineteenth Century in France, Belgium, Spain, and Italy*. His work as a painter consisted largely of landscapes.

HOG CHOLERA. See VETERINARY MEDICINE.

HOGS. See STOCK RAISING AND MEAT PRODUCTION.

HOLDER, CHARLES FREDERICK. An American naturalist and writer, died Oct. 10, 1915. He was born at Lynn, Mass., in 1851, and was educated at the United States Naval Academy in the class of 1869, resigning before graduation. In 1871 he was appointed assistant at the American Museum of Natural History, serving in this position until 1875. At the opening of Throop College of Technology he was appointed to the chair of zoölogy, and after many years of service became honorary curator of its museum. He wrote many books on subjects connected with natural history and zoölogy. Among these are *Elements of Zoölogy* (1885); *Martels of Animal Life* (1886); *Crabs and Insects* (1903); *Game Fishes of the United States* (1913); *Game Fishes of the World* (1913); *The Ocean* (1914); *Angling Adventures Around the World* (1914). He wrote also many sketches and stories, and a biography of Darwin. He was an officer and member of many scientific societies.

HOLLAND. See NETHERLANDS.

HOLMES, JOSEPH AUSTIN. An American geologist and public official, died July 13, 1915. He was born in Laurens, N. C., in 1859, and graduated from Cornell University in 1881. In the same year he was appointed professor of geology and natural history in the University of North Carolina, holding this chair until 1891, when he was appointed State geologist, but remained lecturer on geology in the university. In 1904 he was given charge of the United States Geological Survey laboratories for testing fuels and structural materials. In 1907 he was appointed chief of the technology branch of the United States Geological Survey, and from 1907-10 had charge of the investigation of mine accidents. On the creation of the Bureau of Mines in 1910 he was appointed as chief, and retained this position until his death. He was a member of many scientific societies.

HOLSTEIN CATTLE. See DAIRYING.

HOME RULE, MUNICIPAL. See MUNICIPAL GOVERNMENT.

HONDURAS. A Central American republic. The capital is Tegucigalpa.

AREA, POPULATION, ETC. The area of the republic cannot be definitely stated until the Guatemalan boundary is fixed. The figure now commonly accepted is 114,670 square kilometers (44,274 square miles). The estimated population at the end of 1911 was 566,017; at the end of 1912, 578,482; at the end of 1913, 592,675. The inhabitants are chiefly Indian. In 1913 there were 22,684 births and 10,192 deaths. Tegucigalpa had 22,137 inhabitants in 1910 (1914 estimate, 28,950); Santa Rosa, 10,574; Juticalpa, 10,529; Danté, 8,477; Nacaome, 8,152. Elementary instruction is free, nominally compulsory, and secular. In 1912, elementary

schools numbered 890, with 35,703 pupils; in 1913, 916, with 40,565 pupils. For secondary education, the government subsidizes colleges in the departments and maintains a central institute at Tegucigalpa. At the capital, also, the government supports a so-called university, and at Comayagua a law school. There are five normal schools attached to the colleges.

PRODUCTION, COMMERCE, ETC. The principal crop is bananas, which are cultivated especially along the eastern coast. Corn is next in importance, and other crops are sugar cane, tobacco, coffee, and coconuts. Cabinet woods, particularly mahogany, and rubber are exported. Grazing is an important industry; the number of cattle in 1912 is reported at 420,275, and in 1914 at 489,185; in the latter year there were reported 68,059 horses, 24,700 mules, 22,778 goats, and 180,092 swine. Some gold and silver are mined, but there is little other development of the large mineral resources of the country.

In 1913, imports and exports were valued at \$5,132,678 and \$3,300,254, respectively; in 1914, \$6,624,930 and \$3,421,331. The largest imports are cotton goods and foodstuffs. The principal export is bananas; gold and silver cyanides rank next, followed by coconuts, cattle, and hides and skins. The trade by principal countries is shown below, in thousands of dollars:

	Imports		Exports	
	1913	1914	1913	1914
United States	8,457	5,262	2,869	2,974
Germany	558	522	176	165
United Kingdom	713	460	18	18
France	148	142	2	5

The reported length of railway in 1913 was 186 kilometers (116 miles); in addition, 55 kilometers (34 miles) of plantation railway. In 1914, telegraph offices numbered 250, with 6980 kilometers of wire. Post offices (1912), 278.

FINANCE. The silver peso is the monetary unit; its value fluctuates with the price of silver. At the beginning of 1913 it was worth about 45.1 cents; 1914, about 43.4 cents; 1915, 39.8 cents. Revenue for the fiscal year 1914 amounted to 5,895,194 pesos, as compared with 5,207,232 pesos for 1913, and 4,627,905 pesos for 1912. Expenditure for the fiscal year 1914, 5,774,415 pesos. The expenditure by departments was: interior, 802,043; justice, 176,952; foreign affairs, 134,701; public instruction, 387,798; fomento, public works, and agriculture, 816,868; war and marine, 1,727,215; treasury, 456,607; public credit, 1,272,230. The foreign debt at the end of 1914 amounted, with arrears of interest from 1872, to £30,803,868; internal debt (Aug. 31, 1913), 5,474,732 pesos.

GOVERNMENT. The Congress, which consists of one chamber of 42 members, the President, and the Vice-President, are elected for four years by direct vote. In November, 1911, Gen. Manuel Bonilla was elected President, and Francisco Bertrand Vice-President. They were inaugurated for the four-year term Feb. 1, 1912. On March 13, 1912, Bonilla died and was succeeded by Bertrand. In 1915 Bertrand, with the consent of the Congress, resigned in order that he might become a candidate for the ensuing term; the executive authority was assumed by the first designate, Alberto Membreño, for the period Aug. 1, 1915, to Feb. 1, 1916. Bertrand and Membreño were elected President and Vice-Presi-

dent, respectively, for the term to begin Feb. 1, 1916.

HISTORY. An *ad referendum* treaty of free commerce between Honduras and Salvador was concluded in Tegucigalpa on June 26th. Subject to the approval of the national legislatures of the two countries, the treaty was to be in force for a period of 10 years, or for an indefinite period thereafter, unless either of the contracting parties should desire its discontinuance. Under the terms of the treaty, free exchange of native products was permitted between the two nations, and likewise the exchange of articles manufactured from the raw products of either nation.

HONGKONG. An island (about 32 square miles) off the southeast coast of China, which, with a strip of territory on the mainland leased from China (376 square miles) and about four square miles of the Kowloon Peninsula, forms a British colony. Civil population (1911), 456,730 (Chinese, 444,664). Capital, Victoria (219,755). The island is the centre of an enormous trade. Being a free port, no trade returns are available, but a record of the shipping gives some idea of the extent of the trade (A—ocean-going, B—river steamers, C—steamships under 60 tons in the foreign trade, D—steam launches engaged in local trade):

	Number		Tonnage	
	1911	1913	1911	1913
British A ...	3,907	4,210	7,589,995	8,449,533
Foreign A	4,180	4,679	7,917,640	9,272,635
British B	6,871	6,624	4,116,736	4,078,635
Foreign B	1,423	1,780	736,057	949,328
C	3,263	4,574	130,092	189,003
Junks	25,334	25,653	2,572,588	2,882,518
Total	44,978	47,520	23,063,108	25,821,652
Local D	461,984	416,438	10,981,990	10,720,604
Local Junks ..	36,608	26,270	2,134,054	1,200,726
Total	543,570	490,228	36,179,152	37,742,982

There is little land suitable for tillage on the island, though in the leased territory the Chinese cultivate considerable tracts. Granite quarries are worked, and various manufactories are operated. Shipbuilding and repairing are important industries. A railway from Kowloon to the Chinese frontier joins the line from Canton. The total revenue (1913) is estimated at \$8,512,308; expenditure, \$8,658,012. Public debt, £1,485,732, or approximately \$305,706.

HOOKWORM DISEASE. The first annual report of the Hookworm Commission of the Rockefeller Foundation was issued during the year, and stated that up to Dec. 31, 1914, the commission had treated 19,425 hookworm sufferers throughout the world. It also instituted an educational system by which many thousand people were taught the dangers and the means of fighting the disease. It ascertained that the infection is found within a belt which circles the globe forming a zone 66 degrees wide, centring on the equator, with practically all the countries within the zone infected. Work has been begun by the commission in Egypt, Antigua, British Guiana, Trinidad, St. Lucia, Granada, Panama, Nicaragua, Costa Rica, and Guatemala. The Government and Planters' Association has begun work on the lines of the commission in Ceylon. The labors in the South are also being prosecuted vigorously.

HOPS. The world's hop production in 1915 was estimated at 1,515,000 cwts., which was 554,000 cwts. less than in 1914. The European crop was short as a rule and in many of the principal hop growing regions the yield was only half the yield of the year before. This was due in part to a reduced acreage, but mostly to unfavorable weather conditions. Drouth early in the season together with low temperatures retarded the growth of the crop and later attacks of blight and mold caused further injury, especially in England. Favorable weather towards the close of the growing season produced a crop of good quality although the yields were low. According to foreign estimates Germany with a reduced acreage of 17 per cent as compared with the preceding year, produced 320,000 cwts.; Austria, 250,000; Russia and Belgium, each 30,000; and other countries, exclusive of the United States and England, 15,000 cwts. The hop yield of the United States was estimated at 290,000 bales, of 185 pounds each, as compared with 305,000 bales in 1914. The 1915 crop was distributed as follows: Oregon, 125,000; California, 115,000; Washington, 35,000; and New York, 15,000 bales. The acreage was slightly less than in 1914, an increase of 2 per cent in Washington and 8 per cent in California having been a little more than offset by a 20 per cent decrease in New York. The reduction in acreage in New York was the result of injurious attacks in recent years of blue mold and mildew, low yields, high cost of production, and low prices. During the year ending June 30, 1915, the United States exported 16,210,000 pounds. In the fall of 1915 there was little commercial activity in hops, although the hop trade at that time of the year is generally brisk. This inactivity was largely the result of the interference with international trade by the European war, and the large supplies of hops carried over from the crop of 1914. United States breweries consumed in 1915 about 5,000,000 pounds of hops less than in 1914, the consumption being the lowest in 10 years.

HORN, EDWARD TRAILL. A Lutheran minister, died March 1, 1915. He was born in Easton, Pa., in 1850, and graduated from the Pennsylvania College in 1869. After studying at the Theological Seminary in Philadelphia, in 1872 he was ordained to the Lutheran ministry. He served in pastorates in Philadelphia, Charleston, S. C., and Reading, Pa., until 1911, when he became professor of ethics, and theory and practice of missions in the Lutheran Theological Seminary at Philadelphia. He was president of Lutheran Ministerium from 1909 to 1911, and of the Board of Foreign Missions of the General Council of the Evangelical Church of North America. He was particularly active in liturgical work, and was regarded as the highest authority on the subject in the Lutheran Church. His writings include: *The Christian Year* (1876); *Lutheran Sources of the Common Service* (1890); *The Application of Modern Principles to the Church* (1905); *Summer Sermons* (1908).

HORN, WERNER. See UNITED STATES AND THE WAR.

HORSES. See STOCK RAISING AND MEAT PRODUCTION.

HORTICULTURE. Although the great war had a detrimental effect on commercial horticulture in Europe, the large number of crop shortages reported were due for the most part

to unseasonable weather conditions, diseases, and insect pests. There was a rather general shortage of grapes, prunes, citrus fruits, and olives, and the production of most vegetables was below normal. France produced a good crop of cider apples and the apple and pear crop in Holland was the largest in years. Certain shortages occurred in America and likewise some banner crops were produced. The commercial apple crop in 1915 was some 10 or 15 million barrels short of the 1914 crop of 50,000,000 barrels. California shipped 46,862 cars of citrus fruits as compared with 48,548 cars in 1914. The lemon crop was the largest in the history of the State, as was the fresh deciduous fruit crop, which totaled 16,778 cars as compared with 16,146 cars in 1914. Florida shipped over 25,000 cars of citrus fruits as compared with 21,500 cars in 1914. New York State shipped about 6000 cars of grapes in 1915. The total canned vegetable pack of the United States in 1914 was 15,222,000 cases of tomatoes, 9,789,000 cases of corn, and 8,847,000 cases of peas. A shortage in these packs was announced for 1915. The American peach crop of 1915 amounted to about 50,000 cars as compared with 30,000 cars in 1914. The Irish potato crop approximated 375,000,000 bushels in 1915 as compared with over 400,000,000 bushels in 1914.

EXPORT TRADE. For the fiscal year ending June 30, 1915, the United States exported fruits worth \$34,229,906; vegetables, \$10,813,151; nuts, \$703,211, or a total of \$45,746,268 as compared with \$38,786,792 in 1914. The imports for the same period were: Fruits, \$27,081,396; vegetables, \$9,329,732; nuts, \$16,819,799; a total of \$53,230,927 as compared with \$68,554,793 in 1914. Among the exports for 1915 were \$11,358,124 worth of fresh and dried apples; \$3,851,013 worth of oranges; and beans, peas, and potatoes worth \$5,984,257. Ornamental trees and plants to the value of \$3,748,666 were imported in 1915.

As the year progressed overseas shipments of horticultural products between various countries became more restricted. Some of the smaller insular countries suffered severely from the withdrawal of shipping facilities. The congestion of export products in American ports became so serious toward the close of the year that the shipment of perishable fruits and vegetables was practically abandoned and less perishable products were being sold in America at the purchaser's risk. Export sales of dried fruits broke all records. By December, the filled and unfilled contracts for dried prunes, apricots, and peaches amounted to 100,000,000 million pounds. On the other hand the fall imports of Almeria or Malaga grapes amounted to only 298,450 barrels as compared with 600,000 barrels in the fall of 1914. About December 1st, the French government placed an embargo on the further exportation of nuts from that country for an indefinite period. Receipts of foreign lemons were about cut in half.

The Brazilian government issued a loan of \$37,000,000 to the State of São Paulo for advances to planters who were to place in warehouses the 4,000,000 bags of coffee which have gone to Germany, Austria, and other markets during normal periods. The Hawaiian canned pineapple output for 1915 was about 2,500,000 cases. An active trade in fresh pineapples was established with the mainland during the year.

The canned pineapple industry is being gradually developed in the Bahamas. Japan is developing a promising export trade in onions, potatoes, and apples.

FRUIT STORAGE INVESTIGATIONS. The United States Department of Agriculture had carried on storage experiments with a number of varieties of apples in the Northwest for several years. This work showed that the time for placing apples in cold storage varies with differences of season, section, culture, and soil. Most varieties for storage should be picked at maturity, with the least possible delay from the tree to the storage. A temperature of 32 degrees is usually the most satisfactory. Contrary to common opinion, cold storage apples removed from storage for sale late in the season keep as well as or even better than apples stored at a higher temperature for the same length of time. In the case of varieties which are to be disposed of early in the season, common storage may be made as satisfactory as cold storage. At the Vermont Experiment Station apple storage experiments were conducted for four seasons in a basement room resembling in many respects a farmhouse cellar. Apples kept best by first immersing them in Bordeaux mixture and then packing them in hardwood sawdust. Those immersed in Bordeaux without packing in sawdust kept nearly as well and were somewhat better flavored.

The work of the Department of Agriculture with citrus fruit showed that oranges should be stored at from 38° to 40° F., lemons at about 42°, and grapefruit at 45°. Even at these temperatures the period of successful storage is comparatively short, not usually exceeding two months. Oranges take on a sort of brown stain in storage and are just as susceptible to serious spotting from attacks of *Colletotrichum* as are grapefruit and lemons. The results indicate that avocados may be safely held at a temperature of 32° for a period of two months or more, and other tropical fruits for corresponding periods.

CALIFORNIA GRAPES. The Department of Agriculture announced a number of results of considerable importance in the Vinifera or European grape regions of the United States. It has been found that the adaptability of varieties to soil, climate, and some other conditions can be closely forecast, but congeniality of stock and scion to each other must be determined by actual test. Different species used as stocks for the same variety may increase or diminish its vigor and productiveness as well as the quality and size of the fruit, cause it to ripen earlier or later, and bring about varying results from perfect success to almost complete failure. Congeniality of the variety to the stock materially affects the resistant qualities of the stock. Of the various American species tested as stocks, *Riparia*, *Berlandieri*, *Champini*, and *Aestivalis* are in most instances congenial to *Vinifera* varieties. Fruitfulness is increased and the time of ripening hastened in comparison with the same varieties grown on other stocks.

PLANT BREEDING. In summing up the results of breeding experiments with grapes that had been under way at the New York State Station since 1885 Hedrick and Anthony conclude that improved varieties of grapes will not be produced to any extent until the fundamental laws of heredity are understood. Many commercial

sorts fail to transmit desirable qualities. A vineyard of 1500 seedlings bred from 1898 to 1903 has been reduced by vigorous selection to less than 75 vines out of which five have been tested, named, and placed in the hands of nurserymen. Crossbred seedlings were the most vigorous. Most grapes of high quality were found to possess some European grape blood.

The experiment stations in North and South Carolina and in Georgia made some progress in investigations looking to the improvement of the Scuppernong and other Southern Fox varieties of grapes. In connection with this work the South Carolina Station found that these vines will produce larger bunches of grapes if they are pollinated by a staminate or male vine of the species rather than with pollen from within the fruiting variety.

Among numerous pears under test for immunity to blight at the South Dakota Station, Hansen found the Chinese sand pear (*Pyrus sinensis*) and the birch-leaved pear (*P. betulifolia*), a native of Northern China, to be perfectly hardy and resistant to blight. They have been used freely in crossing with many of the best cultivated pears and have been sent to several States for testing purposes.

The Florida Station has succeeded in breeding one strain of sweet corn which endures hot weather as well as does field corn. The Arizona Station has bred a sweet variety of field corn that is much more vigorous and productive under Arizona conditions than any of the commercial varieties of sugar corn.

Extensive morphological and biological researches on the cultivated radishes lead Yvonne Trouard Riolle to conclude that the cultivated radish has a dual origin. The Japanese radish (*Daiikon*) is descended from *Raphanus sativus raphanistroides*, and the Chinese and most other cultivated radishes are descended from another wild type native to central Asia, but rare or extinct at the present time.

The Oklahoma Station studied the causes of failure to set fruit in the tomato and discovered that a minute insect (*Thrips tritici*) was feeding upon the pollen to such an extent as to bring about almost complete sterility. Varieties producing large quantities of pollen suffered the least. The Pennsylvania Station finds it desirable to secure tomato and some other vegetable seed one year in advance of large plantings in order that the yielding power of the strain may be tested. In a comparison of various strains of the Earliana type of tomato a variation of more than 13 tons per acre of marketable fruit occurred.

PEDIGREEED FRUIT TREES. Although the value of propagating fruit trees from selected buds was still in dispute in 1915, the majority of investigators were in favor of the practice. The bud selection work with citrus fruits in California (see HORTICULTURE, 1914 YEAR BOOK) continued to give good results. Experiments in scion selection were started at the Canada Experiment Station, Ottawa, in 1905. The yields for the three bearing years, 1912 to 1914, indicate that the bearing habit of the parent tree has been perpetuated in each case. A similar experiment conducted with scions selected from a poor-yielding and a high-yielding Ben Davis apple tree at the Missouri Station showed no perceptible difference in the third year's crop in size, color, grade, or quality of the fruit from

the two lots of trees. Observations at the New Hampshire Station indicated that poor yielding in certain trees may be due to unhealthy conditions.

BENCH ROOT OF CITRUS TREES. The California Experiment Station found that the bench root trouble of citrus trees, which had been commonly attributed to the presence of rock or other hard substances beneath the seed when planted, was entirely due to the toughness of the fibrous seed coat through which the root is frequently unable to penetrate until it has bent and twisted itself to the detriment of the future tree. Removing the seed coat very carefully eliminates the bench root. Soaking the seeds from 36 to 48 hours before planting reduces bench root to 15 per cent of the total number of seedlings planted.

NEW FRUITS AND PLANTS. The explorer of the Department of Agriculture sent from the borders of Tibet a large collection of very interesting plants. Among them were the Tanguian almond, the Potanin peach, and an interesting series of wild forms of the ordinary cultivated peach discovered in the mountains of Shansi, Honan, and Kansu. The departmental collection of jujubes and persimmons from these western provinces was largely augmented by the recent collections, and a considerable number of hardy shrubs of probable value for dooryards had been sent in.

FRUIT JUICES. Profiting by the success in concentrating apple cider (see HORTICULTURE, 1914 YEAR BOOK) the Department of Agriculture announced a similar method of concentrating grape juice, which promised to be of value for dealers in beverages. Progress has also been made in the commercial manufacture of juices of red and black currants, blackberries, black raspberries, sour cherries, and peaches.

MISCELLANEOUS. The recently created food and market departments of New York State met with considerable success in standardizing prices for the 1915 State fruit crop. Auction sales were held in New York City and in other places central to the fruit districts. The results have been so encouraging that the department is soliciting the products of California and Florida growers.

The United States Bureau of Foreign and Domestic Commerce appointed a representative, Walter Fischer, to make a tour of the principal countries of South America in which fruit could be sold and to report exhaustively on marketing conditions there. An association was formed and incorporated at Columbus for the purpose of erecting a monument to Johnny Appleseed over his grave at Indianapolis. Johnny Appleseed, whose real name was Jonathan Chapman, was an interesting and eccentric character who sowed apple seeds in the wilds of Ohio and Indiana between 1801 and 1847.

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HORTON, OLIVER HARVEY. An American jurist, died Feb. 7, 1915. He was born in Cattaraugus County, N. Y., in 1835, and was educated in the public schools of Rochester, N. Y., and Kingsville, Ohio. He studied law in the Union College of Law, taking his degree in 1863, and in the same year was admitted to the bar. He began practicing in Chicago, and continued to practice in that city until his death. From 1887 to 1903 he was judge of the circuit court of Illinois, and served in the Appellate Court from 1888-1903. He was actively interested in religious work, and was a trustee of the Garrett Biblical Institute, and several colleges and hospitals. He was a delegate to several important general conventions of the Methodist Episcopal Church.

HOSPITAL BUILDINGS. See ARCHITECTURE.

HOSPITALS. Large sums of money were given to hospitals during 1915. Among the largest donations were the following: to the Maine General Hospital, and to the Eye and Ear Infirmary, Portland, each \$50,000, under the will of John E. Martin; to Dedham, Mass., for the Capen hospital fund, from \$50,000 to \$100,000, by the will of Calvin W. Capen; to Lowell General Hospital and House of Mercy Hospital, Pittsfield, each \$50,000, bequeathed by Frederick W. Pierson of Great Barrington, who perished on the S. S. *Lusitania*; Massachusetts Homeopathic Hospital, \$200,000 and a residual estate, by the will of Helen Collamore; Hahnemann Hospital, Chicago, \$150,000, from Robert Allerton, also \$100,000 from William Wrigley, Jr.; Chicago Home for Destitute Crippled Children, and Mary Thompson Hospital for Women and Children, Chicago, each \$100,000, by the will of Alexander A. McKay; Michael Reese Hospital, Chicago, \$25,000 bequeathed by Edwin G. Foreman; by the will of Dr. Dudley P. Allen, of Cleveland, \$25,000 for equipment of operating department of St. Vincent's Charity Hospital of that city; to Howard Hospital, Philadelphia, \$25,000, by the will of Edward Smith Kelly; to Dr. Wm. G. Choate, Hot Springs, Ark., to establish there a hospital for the poor, \$57,000, under the will of Patrick Fenton, of Knoxville, Tenn.; by the will of Dr. Everett Herrick, \$25,000 to the New York Skin and Cancer Hospital; by the will of Amelia Lavenburg, Montefiore Home and Hospital, and Mount Sinai Hospital, New York City, each \$10,000, also \$2500 to the New York Skin and Cancer Hospital; Presbyterian Hospital, New York City, \$30,000 by will of Evalina A. Meserole; to Mount Sinai Hospital, \$100,000, St. Luke's Hospital, \$25,000, German Hospital, \$25,000, New York Eye and Ear Infirmary, \$25,000, and Lincoln Hospital and Home, \$25,000, all in New York City, under the will of Benjamin Alt-

man; provision in the contested will of Mrs. Cutter, \$700,000 to the Hospital for Deformities and Joint Diseases, New York City; Mt. Sinai Hospital, \$20,000, New York Skin and Cancer Hospital, \$10,000, Presbyterian Hospital, \$12,500, German Hospital, \$2500, as well as \$5000 each to Montefiore Home and St. Luke's Hospital, all in New York City, under the will of Emil C. Bundy; New York Polyclinic Medical School and Hospital, \$50,000, a bequest by Anna Palmer Draper, likewise a donation by a trustee of \$10,000; an equal share in the estate of \$231,158, by the will of Henry Miller, to German, St. Luke's, Roosevelt, and Presbyterian hospitals, New York City. The New York Association for Improving the Condition of the Poor turned over to New York City its new \$250,000 Sea Beach Hospital for Tubercular Children at Rockaway, N. Y.; the buildings are fully equipped to care for 138 children, and when plans are complete there will be 1000 beds. The trustees of the Presbyterian Hospital, New York City, discussed a plan for buying the former American League baseball field, on Washington Heights, containing six city blocks and valued at \$2,000,000, utilizing a bequest of \$2,500,000 from the late John S. Kennedy, the medical work to be in some respects carried on in connection with Columbia University medical department. The new university hospitals erected in Augusta, Ga., at a cost of \$500,000 have been delivered to the city and were opened March 15th. The new Cincinnati General Hospital was transferred to the trustees by the building commissioners, after four years spent in construction at an expense of \$4,000,000. Harry M. Levi promised \$50,000 toward the establishment of a medical school in connection with this new hospital. Under governmental provision, the United States Revenue Cutter *Androscooggin* has been converted into a hospital ship, and began its cruises from Massachusetts to the south shore of Nova Scotia, to treat fishermen incapacitated from illness or injury, and later will cruise to Banquersan and Sable Island banks. In New Zealand, the steamer *Maheno* has been equipped as a hospital ship, with beds for 388 patients, with possibilities for 60 more. It is furnished with sterilizing plant, operating theatres, Roentgen-ray room, and bacteriologic laboratory, and offers all the comforts of a base hospital. The new Emergency Hospital and Central Dispensary, Washington, D. C., is completed and ready for occupancy. It is nine stories in height and has a roof garden. The J. N. Adam Memorial Hospital, Perrysburg, N. Y., was opened October 9th, after costing \$120,000 to erect. It is under the charge of the Buffalo Association for the Relief and Control of Tuberculosis. The Good Samaritan Hospital, Cincinnati, was dedicated October 2nd. The one wing completed cost \$175,000, and the plan calls for expenditure of \$300,000, for a five-wing edifice. The old home for the cancerous poor in Perry Street, New York City, founded by Adrian Iselin, has grown to be the House of Calvary, in the Bronx borough, erected at a cost of \$120,000 and opened in October. In the fall of 1915 the new hospital for Chippewa Indians in Redlake, Minn., was opened, offering accommodations for 25 beds. The Sleeper-Davis Memorial Hospital, Peking, China, was opened in October. It was erected by the Methodist Episcopal Church, at a cost of \$180,000, and accommodates 150 patients. It is manned

by American physicians and Chinese nurses, under an American head nurse. The Samaritan Hospital, a private institution with 25 beds, has been opened in Colon, Panama, the first private hospital in the Canal Zone. The continuance of the European War has necessitated the founding of new hospitals. A special establishment for delicate surgical operations has been opened in Compiègne, France, by Dr. Alexis Carrel, of New York City. The American Hospital, Petrograd, was formally opened November 14th. It provides 40 beds. The first floor of the Quirinal, Rome, has been converted into a hospital, with 206 beds, for wounded soldiers. The Queen planned and equipped this establishment, and it is under the direction of Scaff. Canada has established in all, 16 hospitals, in Great Britain, France, and at the Dardanelles, with staffs numbering 2400 Canadians and 525 trained nurses. The Massey-Harris employees, Toronto, are to erect a convalescent home in England for wounded Canadian soldiers at an expense of \$50,000, besides the cost of the equipment, which was \$25,000. Canadian physicians and nurses will be employed. The Springfield State Hospital, Sykesville, Md., dedicated its new psychopathic building June 9th. It cost \$125,000. The James Brady Urological Institute of Johns Hopkins Hospital was dedicated on May 4th.

The committee on hospital efficiency of the Philadelphia County Medical Society reports that there are in the United States 6665 institutions for the care of the sick, with 600,000 beds, representing an outlay of over \$1,500,000,000, and a yearly expenditure of over \$250,000,000, of which latter sum it is estimated that perhaps 20 per cent is wasted through lack of efficiency. It is requested that the Carnegie Foundation report on the matter of classification and standardization.

In February it was announced that Drs. William J. and Charles H. Mayo, of Rochester, Minn., had established the "Mayo Foundation for Medical Education and Research," had endowed it with \$1,000,000, and affiliated it with the University of Minnesota, under the control of the Regents of the State educational body. The relationship proposed was accepted for a trial period of six years. The opposition that arose has been defeated, the plan has been consummated, and an immense opportunity for research has been opened.

HOTELS. See ARCHITECTURE.

HOUGH, WARWICK. An American jurist, died Oct. 28, 1915. He was born in Loudoun County, Va., in 1836, and graduated from the University of Missouri in 1854. Shortly after his graduation he was appointed assistant State geologist. He studied law, and in 1859 was appointed to the bar. From 1858 to 1861 he was secretary of the Missouri Senate, and was Secretary of the State in 1863, resigning to enter the Confederate army, where he served on the staff of several generals. After the war he resumed the practice of law in Memphis, Tenn., but in 1867 removed to Kansas City. In 1874 he was appointed judge of the Supreme Court of Missouri, and from 1882-84 was Chief Justice. From 1901-07 he was judge of the St. Louis Circuit Court.

HOUSE FLY. See ENTOMOLOGY.

HOWARD UNIVERSITY. An institution for higher learning at Washington, D. C., under the direct supervision of the national govern-

ment. The total enrollment in all departments at the end of 1915 was about 1500. There were 120 members of the faculty. The productive funds for the fiscal year ending 1915 amounted to \$309,018, and the current income from all sources for the fiscal year amounted to \$253,984. The library contained about 30,000 volumes.

HOWE, WALTER. An American soldier, died Nov. 9, 1915. He was born in Bloomington, Ind., in 1846. At the outbreak of the Civil War he attempted to join a volunteer regiment, but was rejected on account of his youth. He later secured an appointment in West Point, and graduated in 1867. He was assigned to the artillery and saw his first fight in 1868, under Sheridan and Custer, against the Indians. He was in command of Fort Washington and Sheridan's Point, Md., and in 1898 was chief mustering officer for Connecticut. In 1899 he was placed in command of the Forty-Seventh United States Volunteer Infantry, and in November of that year sailed with his command for the Philippines. In 1904 he became a colonel, and in 1910 a brigadier-general. For a short time he was in command of the Department of the East, and was in command of the Department of Dakota in 1910, when he retired from active service.

HUBBARD, ELBERT. American author and lecturer, died May 9, 1915. He was born in Bloomington, Ill., in 1859, and received a common school education. After engaging in various occupations, including those of school teacher, printer, editor, and lecturer, he met William Morris in London in 1890, and largely through his influence established the Roycroft Press at East Aurora, N. Y. Out of this grew the Roycrofters corporation, a semi-communal institution giving work to about 800 people. In addition to the publishing of special editions of books, the community engaged in the manufacture of furniture and other commodities. Mr. Hubbard established and edited *The Philistine*, which gained a wide circulation. He printed in this periodical prior to the Spanish-American War an article entitled "A Message to Garcia," a striking lesson on the virtue of strict obedience to orders. This obtained a circulation of millions of copies and made Hubbard famous. His series of *Little Journeys* were also widely sold. Mr. Hubbard had a personality which to certain kinds of people was extremely attractive, and he was in wide demand as a lecturer. Dilettantes in literature keenly relished his writings. In addition to *The Philistine*, he edited and published *The Fra*. His published writings include, besides works already mentioned: *No Enemy but Himself*; *Time and Chance*; *The Legacy*; *Old John Burroughs*; *Consecrated Lives*; *Health and Wealth*; *Love, Life, and Work*; and *One Thousand and One Epigrams*. Mr. Hubbard was one of the victims of the destruction of the steamship *Lusitania*.

HUBBARD, THOMAS HAMLIN. American lawyer, soldier, and financier, died May 19, 1915. He was born in Hallowell, Me., in 1830; graduated from Bowdoin College in 1857; studied law at the Albany Law School; and in 1860 was admitted to the bar of Maine. In 1862 he was commissioned as first lieutenant in the 25th Maine volunteers, and in 1864 was colonel of the 30th Maine infantry. He was brevetted brigadier-general of volunteers in July, 1865, and resigned July 23, 1865. At the close

of the war he went to Savannah to head a board for the examination of volunteers applying for commissions in the regular army. Then he returned to New York City, and resumed the practice of law. He continued this with great success until 1894, when he retired from active law practice to devote himself to business interests. He was an associate of Collis P. Huntington, and was a director of many of the latter's properties. For many years he was a first vice-president of the Southern Pacific Railroad, and was in 1915 elected a member of the board of directors of that road. He was an official and director in many other important corporations and financial institutions. General Hubbard was intimately interested in Arctic exploration, and was the president of the Peary Arctic Club, which helped to support Peary in his explorations. He himself furnished Admiral Peary with large sums of money with which to prosecute his work. He was also a liberal benefactor of Bowdoin College, and presented to that institution an athletic field and a library. He was a member of the board of overseers of that institution at the time of his death. He received the degree of LL.D. from Bowdoin College in 1894.

HUDSON, RICHARD. American educator, died Feb. 22, 1915. He was born at Gates Head, England, in 1845, and removed with his parents to the United States in 1855. In 1871 he graduated from the University of Michigan, and became assistant professor of history in that university in 1879. He was promoted professor in 1888, and held that chair until 1911. From 1897-1907 he was dean of the department of science and the arts. He contributed many historical articles to periodicals. He received the degree of LL.D. from the University of Nashville in 1901.

HUERTA, VICTORIANA. See MEXICO, *History*.

HUMPHREY, LYMAN UNDERWOOD. American public official, former Governor of Kansas, died Sept. 12, 1915. He was born in New Baltimore, Ohio, in 1846. At the age of 17 he enlisted in the 76th Ohio infantry, and served throughout the war. At its close he studied at Mount Vernon College, and in the law department of the University of Michigan. He began the practice of law at Independence, Kan., in 1871, and remained a resident of that city until his death. In 1876 he was a member of the Kansas House of Representatives; from 1877-84 was lieutenant-governor of Kansas; member of Congress for that State from 1884-88; and Governor of the State from 1889-93.

HUNEKER, JAMES. See LITERATURE, ENGLISH AND AMERICAN, *Essays*.

HUNGARY. See AUSTRIA-HUNGARY.

HUNTER, THOMAS. American educator, died Oct. 14, 1915. He was born near Belfast, Ireland, in 1832, and at the age of 18 came to the United States. He at once secured a position as junior teacher in the Thirteenth Street school in New York City. In 1850 he became a teacher in Grammar School No. 35, and his conduct of this school at once gave him reputation among educators. Here he began the first evening high school in New York City. This school was started in 1866, and Dr. Hunter was appointed principal, although he still remained at the head of Grammar School 35. The evening school was so successful that the Board of Education was obliged to double the corps of instructors two

weeks after its opening. In 1870, at the opening of the normal school in New York City, Dr. Hunter was made president and remained in this position until 1906, when he retired. During this period more than 10,000 graduates went out from this school, and he became one of the best known educators in the United States. Shortly after his retirement, the name Hunter College was given to the normal school in Dr. Hunter's honor. An association, known as the Thomas Hunter Association, composed of the graduates of school No. 35, for many years held annual dinners, at which Dr. Hunter was invariably present. After his resignation as president of the normal school, he became president emeritus, and held that post until his death. He received honorary degrees from Columbia and from New York University.

HURRICANES. GALVESTON. The city of Galveston, Texas, on Aug. 16 and 17, 1915, experienced one of the most severe hurricanes in its history. The disastrous storm of 1900 had led to the construction of a massive seawall, to the elevation of the grade of the city, and to the building of a causeway to the mainland, so that while the damage was severe, aggregating possibly between three and four million dollars, yet it was much less than it would have been otherwise. The storm began at 5 o'clock on Monday afternoon, with a wind velocity estimated at 60 miles per hour, which blew the water from the bay into the city, flooding streets and cellars, so that by 9 o'clock water stood from 4 to 6 feet deep in Market Street. The wind, which came from the north, increased in velocity until about 2 A. M., August 17th, when it was estimated that it had a velocity of 90 miles per hour. In the meantime it had veered from the north around to the east and then to the south, from which latter direction it drove the waves from the gulf in against the seawall. The seawall, which extended for approximately 3 miles along the gulf front of the city, was constructed of concrete reinforced with a single line of rods near the curved face, resting on piles, and protected in front by riprap and a line of sheet piling. This wall was originally intended to be protected at the rear by an earth fill 100 feet wide, which would afford a boulevard, but a later plan involved filling in behind the walls for such a distance as would raise the grade from 10 to 16 feet over the entire island.

This concrete wall passed through the storm of August 16th and 17th most successfully. At only two places did the waters of the gulf penetrate beneath the structure, and this but temporarily and without damage. Some damage at these points was done to the material that was swept through two temporary gaps beneath the wall, and considerable injury was produced in the back fill and pavement by the tremendous masses of water that were hurled distances of 200 feet or more beyond the crest. This resulted in washing out the back fill, undermining pavements, and forming a wide stretch of beach behind the wall.

While the seawall not only remained substantially intact and saved the city from destruction, the line of communication with the mainland—a long causeway for railway and other traffic, consisting of a protected roadway and a series of reinforced concrete arches of 70-foot span, with a rolling lift steel bridge of 100-foot span in the centre—was seriously damaged, and the

city was cut off from communication with the mainland. The reinforced concrete structure, however, and the bridge, were practically uninjured, but the protected roadway, which consisted of sand and gravel fill 199 feet wide on top, was badly damaged. In this roadway the side slopes were protected by 6-inch concrete slabs, whose toes rested on tongued and grooved concrete piling which was poured full of concrete so as to make a solid wall, and the concrete sheet piling was then capped. While the concrete piling remained intact, the sand and gravel fill was scooped out by the action of the water letting down the concrete slabs. The 30-inch water main in the causeway, bringing the water from the mainland, was broken and occasioned much hardship. The people of the city suffered from lack of drinking water, as a second water main laid on the bottom of the bay was also broken. After the storm an 8-inch main was laid in 17 hours from the mainland and better conditions obtained.

The city streets were submerged to an approximate depth of 6 feet and practically every retail establishment was flooded. The telephone system was put out of commission by the storm, but was soon restored with an automobile engine as the source of power. The citizens proceeded rapidly to clean up the debris, and a pile trestle was erected as a substitute for the destroyed causeway approaches in the short time of one week. After the disaster the city manifested the most hopeful and active spirit, and Gen. H. M. Robert, U. S. A., Ret., was called in as consulting engineer to advise on the strengthening of the water front defenses. He recommended that the brick pavement be widened 30 feet, that is, extended to a distance 100 feet back from the back of the wall, and that there be built a reinforced concrete sheet pile bulkhead 14 feet deep to prevent undermining. This plan was adopted, as was also the recommendation that 20,000 tons of rock be placed at the toe of the seawall to protect it from undermining, and also to protect the first row of piles and the wood sheet piling from the ravages of the teredo.

A further recommendation dealt with the necessity of planting with Bermuda grass the space beyond the 100-foot boulevard. This recommendation had been made previously, but it had been generally disregarded, with disastrous effect. Where the grass had been planted there was no undermining, but where shell or sand drives or walks crossed the lawns cutting was apt to start, spreading under the pavements. It was recommended that the sod protection should be carried back if possible a distance of 300 feet from the seawall, and that from a clay mound 2 feet high and 5 feet wide, at the back edge of the pavement, a 2 per cent grade should be made for a still further protection, which at its rear would be 23 feet 6 inches higher than the seawall.

In addition to destruction and loss in the city, heavy damage was experienced by the Sunset Central and other railway lines in the vicinity of Galveston, their losses being estimated conservatively at \$375,000. While the hurricane was most severe at Galveston, yet it extended along the entire coast.

NEW ORLEANS. On September 29th a hurricane passed over New Orleans, La., and vicinity, causing the deaths of about 300 people and a loss

of property estimated at over \$1,000,000. This hurricane came from the Gulf of Mexico and struck New Orleans about 8 A. M., the wind increasing in velocity during the day until in the afternoon, between 4.30 and 7.30, it was blowing at a rate of 80 to 120 miles per hour, and the barometer fell to 28.11, which was said to be the lowest ever recorded in the United States. In 21 hours 8.36 inches of rain fell. Much damage was done to buildings in the city and the country for miles was devastated and railway and wire service interrupted. The waters of Lake Pontchartrain, north of New Orleans, formed a tidal wave nearly 12 feet in height under the influence of the storm, and when it struck the western shore overflowed the country for miles. Much damage was done to the lines of the Louisville and Nashville, the Illinois Central, the Sunset Central, and other railways, varying all the way from the destruction of bridges to the washing out of embankments. The subsidence of the storm at 9 o'clock in the evening, and the flooding back of much of the water from Lake Pontchartrain to the surrounding country helped matters considerably, but people were obliged to take refuge in trees and great damage was done to property. The rainfall in succeeding storms was also heavy, and in 15 days 22.24 inches fell, which seriously interfered with the drainage and sewerage systems of the city and surrounding country, for the ground level of New Orleans being below river level it must be pumped.

HYDRATICS. The use of water as a medicinal agent. See **HYDROTHERAPY**.

HYDRO-ELECTRIC. See **ELECTRIC POWER**, **TRANSMISSION OF**.

HYDROPATHY. A word of improper etymology, formerly signifying the practice of an extinct sect which employed water treatment to the exclusion of medicine. See **HYDROTHERAPY**.

HYDROPLANE. See **AERONAUTICS**.

HYDROTHERAPY. The treatment of disease with water, either fresh still water, or brine, or effervescing mineral water, is surely and progressively gaining on other therapeutic procedures which consist largely of drugs. The return to natural foods, natural methods of living, and the use of fresh air day and night, and exercise accompanies the use of water at exact temperatures and for prescribed duration. The great European war caused the closure of almost all the German and Austrian spas, and in these countries and in France many of the bath establishments were devoted to the care of wounded men from the battlefields. In America, a revival of interest in home facilities was noticed, and increased numbers of patients were treated at Hot Springs, Va., Greenbrier White Sulphur Springs, W. Va., French Lick, Ind., Mt. Clemons, Mich., Battle Creek, Mich., Old Point Comfort, Va., Clifton Springs, N. Y., Glen Springs, Watkins, N. Y., Manitou Springs, Col., etc., as well as at Hot Springs, Ark., under United States control, and Saratoga Springs, N. Y., under State control. The last named locality was equipped for 1915 for the "Saraghtoghie Bath" (Nauheim style), as well as for general hydrotherapy. Dr. J. H. Honan, who had practiced during the summer at Bad-Nauheim, Germany, for a score of years, and for several winters had practiced hydrotherapy at Augusta, Ga., practiced at Shawnee, Pa., last summer. Kellogg, of Battle Creek, introduced the apparatus of his invention known as the

surf bath. It is applied to any bath tub so that one grasps handles, swings back and forth in the tub, as if rowing, and with each stroke empties a small scoop of water over the body from the neck down.

HYGIENE. The steadily growing popularity of indoor swimming pools and their multiplication throughout the country, creates a sanitary problem of no little interest. While promoting cleanliness, they are also particularly adapted for spreading disease. When it is considered that in some parts of the country the use of swimming pools by pupils of secondary schools is made compulsory, it will be seen that officious public hygiene assumes considerable responsibility. The diseases commonly found to be communicable in swimming pools are divided into intestinal maladies, e.g. typhoid fever and diarrhoea, eye and ear infections, and venereal diseases. The examination of swimming pool water for colon bacilli is considered an index of its relative pollution. Manheimer, of Columbia University, New York, has investigated the purity of swimming pools of all varieties in the city of New York. He finds that those of the collegiate institutions are in very good condition; the bacteriologic content of the water in one pool closely approximating that of drinking water. Such perfection can only be obtained by a careful inspection and thorough bathing of the swimmers before they enter the water, and by their observance of pool sanitation while in it. The source of the water must be pure, it must be frequently renewed and filtered. Chemical disinfection was most efficient. The public pools are less efficiently cared for, the attendance is promiscuous, and contagious diseases are apt to be disseminated. The examination of the free floating baths stationed during the summer at docks in the East and Hudson rivers, New York City, as far away from sewer outlets as possible, showed their sanitary condition to be extremely bad. Of the chemical disinfectants, calcium hypochlorite and copper sulphate are most used, the latter apparently being more effective in that it does not readily undergo chemical changes. It is not irritating to the eyes and mucous membranes, it is cheaper, and has no odor. Certain pools are kept clean by a constant flow of water which has previously been subjected to the violet rays.

Herbert Ant, chemist for the Reservation at Saratoga Springs, N. Y., secured the following data from the two out-door pleasure swimming pools at the State Lincoln Bath House, during the midsummer months of 1915:

	Bacteria per c.c.	Red (colon) colonies
July average for 1 ft. below surface...	75	10
July average for 5 ft. below surface...	300	60
August average for 1 ft. below surface...	180	20
August average for 5 ft. below surface...	360	80

During this period, a dosage of .35 of a part per million of available chlorine, obtained from hypochlorite of lime, was used, in connection with the filtration through a New York Continental Jewell pressure filter, in which 1.5 grains of alum were used as a coagulant. At the end of an August day, after 25 to 40 people had been in the pools continuously, the counts were 3000 bacteria per c.c., with 700 red colonies. An additional dosage of .15 parts per million of

chlorine, together with draining and scrubbing the pool brought the count, September 1st, down to 275 bacteria per c.c. and 40 red colonies. Most bathers obeyed the rule and took a soap bath and spray before entering the pools.

Thomas strongly advocates the use of copper sulphate and gives a simple method of applying it. He found on analyzing the pool water in the Taylor Gymnasium at Lehigh University, that it contained 10 bacteria per cubic centimeter and no colon bacilli, just after the water had been filtered and admitted to the tank and before any bathers had entered it. After 40 men had been in the pool, although all the preliminary sanitary precautions had been taken, the water contained 5300 bacteria per cubic centimeter, 200 of which were colon bacilli. He found that one-twentieth part of copper sulphate to a million parts of water, used every day, kept the water pure, but this amount may be adapted to the particular pool, depending on the number of bathers and cubic contents of the water supplied. Where the capacity of the tank in gallons is known, the problem simply amounts to multiplying the number of gallons by 8.3 (the weight in pounds of a gallon of water), and dividing the weight of the water thus determined by 2,000,000 (the solution being one-half part per million). This gives the weight in pounds of copper sulphate to be added. A pool containing 90,000 gallons of water, for instance, would require 0.37 pounds, or about 6 ounces of copper sulphate. The copper sulphate should be added daily. The salt may be simply placed in a bag and thrown in the pool, or it may be dissolved in a quart or more of water and poured in. The cheapness of these methods is shown by the fact that 100 pounds, at \$7, would last the average pool about a year. For other aspects of the question, see PROSTITUTION.

HYGIENE ASSOCIATION, AMERICAN SOCIAL. See PROSTITUTION, *Social Hygiene*.

IBSEN'S *John Gabriel Bookman*. See DRAMA, AMERICAN AND ENGLISH.

ICELAND. A Danish crown colony. Area about 40,456 square miles, of which 16,245 square miles inhabited; population (1911), 85,183. The responsible executive resides at Reykjavik. The trade in 1912 amounted to 15,347,000 kroner imports, and 16,558,000 kroner exports, the latter consisting of wool, dried fish, mutton, ponies, and sheep. The Legislature (Althing) has 40 members, 34 elective by universal suffrage. The franchise is exercised by men and women over 25 years of age. On June 19th the King of Denmark signed the suffrage bill, which had been passed by the Parliament of Iceland in 1914, granting full rights of suffrage to the women of Iceland.

IDAHO. POPULATION. The estimated population of the State on July 1, 1915, was 411,996. The population in 1910 was 325,594.

AGRICULTURE. The acreage, production, and value of the principal crops, estimated by the United States Department of Agriculture in 1914-15 were as follows:

		Acreage	Prod. Bu.	Value
Corn	1915	22,000	770,000	\$500,000
	1914	19,000	589,000	424,000
Wheat	1915	670,000	18,730,000	14,984,000
	1914	549,000	14,862,000	12,495,000
Oats	1915	335,000	15,745,000	5,353,000
	1914	332,000	14,608,000	5,551,000
Rye	1915	3,000	60,000	41,000
	1914	3,000	60,000	41,000

		Acreage	Prod. Bu.	Value
Barley	1915	191,000	7,736,000	4,023,000
	1914	185,000	7,030,000	3,515,000
Potatoes	1915	28,000	3,500,000	1,960,000
	1914	34,000	5,270,000	2,530,000
Hay	1915	677,000	1,828,000	14,076,000
	1914	705,000	1,868,000	18,636,000

a Tons.

LIVE STOCK. The United States Department of Agriculture estimated that on Jan. 1, 1916, and Jan. 1, 1915, horses numbered 241,000 and 243,000, valued at \$21,690,000 and \$22,356,000; mules numbered 4000 and 4000, valued at \$380,000 and \$340,000; milch cows numbered 126,000 and 120,000, valued at \$8,316,000 and \$8,640,000; other cattle numbered 406,000 and 379,000, valued at \$15,672,000 and \$15,842,000; sheep numbered 3,102,000 and 3,041,000, valued at \$17,371,000 and \$14,293,000; swine numbered 344,000 and 328,000, valued at \$2,408,000 and \$3,208,000. The production of wool in 1915 and 1914 was 14,792,000 and 15,286,000 pounds respectively.

MINERAL PRODUCTION. The lead produced in 1914 amounted to 174,263 short tons, valued at \$13,592,517, compared with 158,936 short tons, valued at \$13,986,366 in 1913. The State ranks second in the Union in the value of lead produced. The production of gold in the State in 1914 was \$1,152,315, compared with \$1,344,559 in 1913. The production from placer mines was \$700,454.

The mined production of silver in 1914 was 12,479,516 fine ounces, valued at \$6,901,172. This is the largest yield in the history of the State. The production in 1913 was 9,998,193 ounces, valued at \$6,033,473. The increase was almost entirely from the silver bearing lead, and lead zinc ore of the Cœur d'Alene region, in Shoshone County. In 1914 Idaho produced 6,445,187 pounds of copper, valued at \$857,210, compared with 9,592,966 pounds, valued at \$1,486,910, in 1913. The value of the total mineral production in 1914 was \$24,913,223 in 1914, compared with \$24,565,826 in 1913.

EDUCATION. There were in the State in 1915 120,000 pupils in public schools, compared with 113,850 in 1914. In the latter year there were enrolled in the schools 92,437 pupils. Teachers numbered 2943, of whom 2276 were women, and 667 were men. The average salary of women teachers amounted to \$72.55 monthly, and of the men teachers \$95.25 monthly. The total expenditure for educational purposes in 1914 was \$4,296,964.

FINANCE. The total receipts from all sources for the fiscal year was \$3,064,903, and at the same period the total disbursements were \$3,172,250. There was at the beginning of the year a balance of \$246,350, and on Sept. 30, 1915, there was a balance of \$1,132,647. The chief sources of revenue are taxes, interest on State funds, and fees. The chief expenditures are maintenance, salaries, and interest on State bonds. The bonded debt of the State amounted to \$2,237,750.

CHARITIES AND CORRECTIONS. The State institutions include a Soldiers' Home at Boise, State Penitentiary at Boise, the Idaho Insane Asylum at Black Foot, the North Dakota Insane Asylum at Orofino, Idaho State Sanitarium at Nampa.

POLITICS AND GOVERNMENT. The Legislature met in 1915, and enacted a number of important

measures. On January 13th an anti-alien land ownership bill was introduced in the House of Representatives. It prohibited land ownership in the State by alien persons, firms, or associations, except by the enforcement of liens, or through inheritance, in which case it must be disposed of in five years, or forfeited. The House passed the bill on January 20th, only two dissenting votes being cast.

The Senate, on January 20th, passed a resolution providing for the submission to the voters of a constitutional amendment prohibiting the manufacture and sale of intoxicating liquors, after May 1, 1917. The Senate, on February 25th, as a substitute, passed a State-wide prohibition bill, which makes the manufacture and transportation or sale of intoxicating liquors unlawful after Jan. 1, 1916. The bill was signed by Governor Alexander on March 1st and became a law.

The Legislature enacted a bill providing for the employment of convicts for the building of roads in mountain districts. A law was also passed compelling county commissioners to provide emergency work for the unemployed. A workmen's compensation bill was vetoed by the Governor.

STATE GOVERNMENT. Governor, Moses Alexander; Lieutenant-Governor, Herman H. Taylor; Secretary of State, George R. Barker; State Auditor, Fred L. Huston; State Treasurer, John W. Eagleson; Attorney-General, Joseph H. Peterson; Superintendent of Public Instruction, Bernice McCoy; Inspector of Mines, Robert N. Bell; all Republicans except the Governor.

JUDICIARY. Supreme Court: Chief Justice, Isaac N. Sullivan; Associate Justices, Alfred Budge and William M. Morgan.

STATE LEGISLATURE:

	Senate	House	Joint Ballot
Republicans	19	82	51
Democrats	11	28	39
Progressives	2	1	3
Socialists	1	0	1
Republican majority..	5	3	8

IDAHO, UNIVERSITY OF. An institution for higher education, founded in 1892 at Moscow, Idaho. The total enrollment in all departments in the autumn of 1915 was 796. This includes those enrolled in the summer school and short courses. The faculty numbered 72. During the year a school of education was organized, and departments of psychology and sociology were established. Dr. R. R. Goodrich was appointed head of the department of metallurgy. The productive funds at the end of the fiscal year amounted to \$666,346, and the income to \$264,803. The library contained 31,104 volumes.

ILLINOIS. POPULATION. The estimated population of the State on July 1, 1915, was 6,069,519. The population in 1910 was 5,638,591.

AGRICULTURE. The acreage, production, and value of the principal crops estimated by the United States Department of Agriculture in 1914-15, were as follows:

	Acreage	Prod. Bu.	Value
Corn 1915	10,449,000	376,164,000	\$208,129,000
..... 1914	10,346,000	800,084,000	183,021,000
Wheat ... 1915	2,800,000	53,200,000	53,200,000
..... 1914	2,500,000	46,250,000	46,712,000

	Acreage	Prod. Bu.	Value
Oats 1915	4,843,000	195,435,000	68,402,000
..... 1914	4,800,000	125,990,000	55,436,000
Rye 1915	49,000	906,000	752,000
..... 1914	49,000	784,000	666,000
Barley ... 1915	54,000	1,838,000	1,047,000
..... 1914	55,000	1,622,000	989,000
Potatoes .. 1915	126,000	13,860,000	8,177,000
..... 1914	124,000	7,440,000	4,538,000
Hay 1915	2,400,000	a 3,696,000	39,917,000
..... 1914	2,250,000	1,912,000	27,533,000
Tobacco ... 1915	700	b 595,000	54,000
..... 1914	600	468,000	56,000

a Tons. b Pounds.

LIVE STOCK. The United States Department of Agriculture estimated that on Jan. 1, 1916, and Jan. 1, 1915, horses numbered 1,452,000 and 1,467,000, valued at \$149,556,000 and \$154,035,000; mules numbered 152,000 and 145,000, valued at \$16,872,000 and \$15,950,000; milch cows numbered 1,047,000 and 1,007,000, valued at \$63,029,000 and \$59,916,000; other cattle numbered 1,239,000 and 1,180,000, valued at \$47,702,000 and \$44,604,000; sheep numbered 907,000 and 935,000, valued at \$5,351,000 and \$5,049,000; swine numbered 4,489,000 and 4,358,000, valued at \$40,401,000 and \$47,066,000. The production of wool in 1915 and 1914 was 3,975,000 and 3,853,000 pounds respectively.

MINERAL PRODUCTION. The production of coal in 1914 was 57,589,187 short tons, valued at \$64,692,529, compared with 61,618,744 tons, valued at \$70,313,605. This tonnage compares well with the figures of the largest productions of the State. The supply of labor was plentiful and transportation accommodations were adequate throughout the year, except during the biennial shutdown, which has now become a regular incident of the spring months of the even year in Illinois coal mining, which began on April 1, 1914, and lasts in certain districts from 30 to 60 days. The principal increase in 1914 was in Franklin County, where a large amount of developing has taken place during the last four years.

The production of petroleum in the State in 1914 was 21,919,749 barrels. This was a decline of 1,974,150 barrels compared with the output in 1913, but it indicated a notable improvement compared with the decline of 16.45 per cent of the previous year to that year. The State continued to hold third place in the total production. The average price per barrel was \$1.16. There were completed during the year 1105 wells, in 21 counties. The total number of wells drilled for oil prior to Jan. 1, 1915, was 24,566, of which 4120 were unsuccessful. The value of the total mineral production in 1914 was \$117,145,108, compared with \$131,825,221 in 1913. The State ranked third in the Union in value of mineral products.

EDUCATION. The total school population in 1914 was 1,650,258. The enrollment in the elementary schools was 957,926; of these 489,138 were boys, and 468,788 were girls. In the secondary schools were enrolled 85,301, making a grand total of 1,043,227. The total number of teachers was 31,805, of whom 26,135 were women and 5770 were men. The average annual salary of men teachers was \$796.19, and of women teachers \$660.15. The total value of the school property was \$119,568,943. The total expenditures for the schools amounted to \$51,141,928.

CHARITIES AND CORRECTIONS. The State institutions include Elgin State Hospital, Kanka-

kee State Hospital, Jacksonville State Hospital, Anna State Hospital, Watertown State Hospital, Peoria State Hospital, Chester State Hospital, and the Chicago State Hospital; the Lincoln State School and Colony, the State School for the Deaf, Illinois State School for the Blind, Illinois Industrial Home for the Blind, Soldiers' and Sailors' Home, Soldiers' Widows' Home, Soldiers' Orphans' Home, Charitable Eye and Ear Infirmary, State Training School for Girls, St. Charles School for Boys, Alton State Hospital, State Penitentiaries at Joliet and Chester, and the Illinois State Reformatory at Pontiac.

FINANCE. The total receipts from all sources for the fiscal year 1915 were \$17,930,687. The total disbursements for the same period amounted to \$21,772,154. The chief sources of revenue are from taxes, inheritance taxes, and State departments. The chief expenditures are for charitable and educational institutions. The State has no bonded debt.

POLITICS AND GOVERNMENT. The Legislature met in 1915, but passed no measures of first importance. See **LEGISLATION** in 1915. In a local option election held on April 6th, no-license was successful in most of the central and southern cities. The women who voted in this election divided their ballots almost evenly between the two issues. Centralia, which had been under license for 60 years, voted no-license by a majority of about 300. A measure providing for a maximum hour and a minimum wage law for women was passed. The Supreme Court of the State, on August 28th, upheld the woman suffrage act passed in 1913. The United States Supreme Court, in the decision handed down June 21st, upheld the Illinois Pure Food Law. The case was that of a seller of a canning compound, which contained boric acid. The Supreme Court upheld the conviction of the seller on the ground that the compound was not sold as a food, but as a preservative. On July 1st, an anti-tipping law went into effect. A suit it involved was brought on the same day.

CHICAGO. On February 23rd, Carter H. Harrison, five times mayor of the city, was defeated by Robert M. Schweitzer at the primary election for the nomination for a sixth term. These primaries were the first at which the women of Chicago were entitled to the same voting privileges as men. About 77 per cent of the women registered, and 154,637 voted. William H. Thompson received the Republican nomination. At the election of April 6th, Mr. Thompson was elected, defeating Robert M. Schweitzer by a plurality of about 139,000. This is the largest plurality ever polled by the successful candidate for mayor of Chicago. The Republicans elected also the remainder of the ticket, including city treasurer, city clerk, and judge of the municipal court. About one-half of the aldermen elected were Republicans or Progressives. Women for the first time took part in an election for mayor. They swelled the total vote, but did not affect the result, as they were divided between the candidates in about the same proportion as the men.

On April 15th, 16,000 union carpenters went on strike in the city, following a demand for an increase in wages from 65 to 70 cents an hour. Operations on buildings involving more than \$30,000,000 were tied up, while 125,000 workers in building trades were idle. On April 30th, the bridge and structural iron workers also struck, and these were followed by metal workers, paint-

ers, and lathers. On June 14th, street and elevated railways were tied up as a result of a strike of the employees. After negotiations with the mayor it was agreed to submit questions at issue to arbitration (see **STRIKES**). For an account of the *Eastland* disaster, see **SAFETY AT SEA**.

STATE GOVERNMENT. Governor, Edward F. Dunne; Lieutenant-Governor, Barratt O'Hara; Secretary of State, Lewis G. Stevenson; Auditor of Public Accounts, James J. Brady; Treasurer, Andrew Russel; Superintendent of Public Instruction, Francis G. Blair; Attorney-General, Patrick J. Lucey. All Democrats except Treasurer and Superintendent of Public Instruction.

JUDICIARY. Supreme Court: Warren M. Duncan, R.; William M. Farmer, D.; Frank K. Dunn, R.; George A. Cooke, D.; Charles C. Craig, D.; James H. Cartwright, R.; Orrin N. Carter, R.

STATE LEGISLATURE:

	<i>Senate</i>	<i>House</i>	<i>Joint Ballot</i>
Republicans	25	78	103
Democrats	25	70	95
Progressives	1	2	3
Socialists	..	2	2
Republican majority..	..	4	8

ILLINOIS, UNIVERSITY OF. A State university for higher education founded in 1867 at Urbana and Chicago. The total enrollment in all departments in the autumn of 1915 was 5511. In the summer school of 1915 there were enrolled 639 students. The faculty numbered 657. Frederick H. Newell was appointed professor of civil engineering, and Kenneth McKenzie professor of Romance languages. The total income for the year 1915-16 was \$3,061,377. The library contained about 350,000 bound volumes, and about 85,000 pamphlets. President, Edmund J. James, Ph.D., LL.D.

ILLINOIS CANAL. See **CANALS**.

IMAGIST POETS. See **LITERATURE, ENGLISH AND AMERICAN, Poetry**.

IMMIGRATION AND EMIGRATION. The immigration for the year 1915 was greatly affected by the war. For several years previous the immigrants arrived had averaged about 1,000,000 a year, but after the outbreak of the war it was demonstrated that the increase in the population through immigration would be the smallest in any one year for more than a decade. Problems dealing with the enforcement of the law as a result of conditions in Europe were many and complicated. For the first few months it was impossible to determine definitely that any alien rejected at United States ports or arriving within the borders of the country could be returned to the place of origin in Europe without placing him in a position of extreme danger either on the high seas or after being landed at port. For a time it was necessary to suspend deportation to countries at war, irrespective of whether the alien involved had been rejected at the ports or had been arrested within the country on charges of unlawful residence. Measures were taken to avoid to the fullest extent possible the placing in danger of aliens under orders of exclusion or expulsion. At the close there were 1328 aliens, who, under the terms of the statutes had no right to be landed, and whose eventual deportation it has been attempted to assure by accepting bonds

where instruments could be furnished or by releasing the persons by parole, or in the care of responsible persons or societies. Nearly every phase of the administration of the immigration law was affected during the year by conditions of the war.

During the fiscal year 1915, the number of persons immigrating to the United States was 326,700, compared with 1,218,480 in 1914. During the same time 107,544 non-immigrant aliens entered the country, making a total of 434,244 admissions. Non-immigrants are those who do not intend to remain permanently in the country. During the year 204,074 aliens emigrated and 180,100 non-emigrant aliens left, making the total departure 384,174, so that the actual increase in the population through immigration was only 50,070, compared with an increase for the fiscal year 1914 of 768,276.

The efforts of Congress to amend the immigration laws in order to restrict emigration, were defeated by the veto of the Burnett Bill by President Wilson. The chief feature of the bill, and the ground on which it was vetoed, was the application of the illiteracy test to immigrants. The following table shows the net increase or decrease of the population by the arrival and departure of aliens for the fiscal year ending June 30, 1915.

British India, which formerly was Calcutta, has been Delhi since 1912.

AREA AND POPULATION. The combined area of British India and the Native States under British suzerainty, as covered by the 1911 census, is stated at 1,802,657 square miles. This territory is somewhat larger than the combined area of the States of the United States lying west of the Mississippi River, less Nevada, New Mexico, and Arizona—which is 1,799,033 square miles. British territory, which is divided into 15 provincial governments, comprises 1,093,074 square miles; the Native States aggregate 709,583 square miles. Interprovincial transfers of territory, and transfers from native to British territory, and vice versa, occasionally take place, so that censuses as originally reported are subject to adjustment. The table on page 316 shows the area of the British provinces and of the groups of native states, and the population according to the censuses of March 15, 1901, and March 10, 1911. The population returned at these censuses and the areas have been adjusted, as far as possible, to allow for subsequent interprovincial transfers. Sikkim, which in 1901 was classed under the Bengal States, is shown separately in the 1911 census. The tribal areas in the North-West Frontier Province are now shown under native states. Man-

NET INCREASE, FISCAL YEAR ENDED JUNE 30, 1915, BY COUNTRIES

Country of last or future permanent residence	Admitted			Departed			Increase (+) or decrease (—)
	Immigrant aliens	Non-immigrant aliens	Total	Emigrant aliens	Non-emigrant aliens	Total	
Austria	9,215	635	9,850	6,776	721	7,497	+ 2,353
Hungary	9,296	109	9,405	5,059	980	5,989	+ 3,416
Belgium	2,399	248	2,647	833	318	651	+ 1,996
Bulgaria, Serbia, and Montenegro...	1,403	42	1,445	1,964	556	2,520	— 1,075
Denmark	3,312	232	3,544	412	482	894	+ 2,650
France, including Corsica	4,811	1,485	6,296	5,751	2,371	8,622	+ 2,326
German Empire	7,799	1,069	8,868	1,419	2,456	3,875	+ 4,993
Greece	12,592	241	12,833	9,775	1,241	11,016	+ 1,817
Italy, including Sicily and Sardinia	49,688	1,967	51,655	96,903	20,082	116,985	— 65,330
Netherlands	3,144	899	4,043	612	1,319	1,931	+ 1,612
Norway	7,986	1,013	8,999	1,211	753	1,964	+ 7,035
Portugal, including Cape Verde and Azore Islands	4,907	21	4,928	2,661	310	2,971	+ 1,957
Rumania	481	20	501	244	77	321	+ 180
Russian Empire and Finland	26,187	774	26,961	18,297	3,983	22,280	+ 4,681
Spain, including Canary and Balearic Islands	2,762	802	3,564	3,042	2,021	5,063	— 1,499
Sweden	6,585	218	6,803	953	484	1,437	+ 5,366
Switzerland	1,742	206	1,948	349	396	745	+ 1,203
Turkey in Europe	1,008	28	1,036	164	51	215	+ 821
United Kingdom:							
England	21,562	5,613	27,175	7,715	19,987	27,702	— 527
Ireland	14,185	375	14,560	2,218	1,264	3,482	+ 11,078
Scotland	4,668	931	5,599	1,847	2,867	4,714	+ 885
Wales	1,007	113	1,120	169	177	346	+ 774
Other Europe	1,180	80	1,260	80	116	196	+ 1,014
Total Europe	197,919	16,571	214,490	167,954	63,462	231,416	— 16,926

INCANDESCENT LAMPS. See ELECTRIC LIGHTING.

INCINERATION OF GARBAGE. See GARBAGE AND REFUSE DISPOSAL.

INCOME TAX. See TAXATION.

INCREASED COST OF LIVING. See PRICES, *passim*, and FOOD AND NUTRITION.

INDIA, BRITISH. British India is that part of East India administered by the British sovereign (as Emperor of India), through the Governor-General of India in council. India, as defined by the British Parliament, includes British India and the Native States under the suzerainty of the British government. The capital of

British India, which formerly was Calcutta, has been Delhi since 1912. The combined area of British India and the Native States under British suzerainty, as covered by the 1911 census, is stated at 1,802,657 square miles. This territory is somewhat larger than the combined area of the States of the United States lying west of the Mississippi River, less Nevada, New Mexico, and Arizona—which is 1,799,033 square miles. British territory, which is divided into 15 provincial governments, comprises 1,093,074 square miles; the Native States aggregate 709,583 square miles. Interprovincial transfers of territory, and transfers from native to British territory, and vice versa, occasionally take place, so that censuses as originally reported are subject to adjustment. The table on page 316 shows the area of the British provinces and of the groups of native states, and the population according to the censuses of March 15, 1901, and March 10, 1911. The population returned at these censuses and the areas have been adjusted, as far as possible, to allow for subsequent interprovincial transfers. Sikkim, which in 1901 was classed under the Bengal States, is shown separately in the 1911 census. The tribal areas in the North-West Frontier Province are now shown under native states. Man-

still another new province, Delhi, was erected out of the division of Delhi in the Punjab; its area is provisionally stated at 557 square miles, and its 1911 population at 391,828. The area censused on March 10, 1911, and the population on that date, as compared with the population on March 15, 1901, are as follows (the figures being adjusted, as far as possible, to subsequent interprovincial transfers):

Provinces	Sq. m.	1901	Population 1911
Ajmer-Merwara ..	2,711	476,912	501,395
Andamans and Nicobars	8,143	24,649	26,459
Assam	58,015	5,841,878	6,718,635
Baluchistan	54,228	382,106	414,412
Bengal (Pres.)	78,669	42,141,477	45,488,077
Bihar and Orissa	83,181	38,242,788	34,490,084
Bihar *	42,861	28,360,212	28,752,969
Orissa *	18,748	4,982,142	5,181,758
Chota Nagpur *	27,077	4,900,429	5,605,362
Bombay (Pres.)	128,059	18,559,650	19,672,642
Bombay †	75,993	15,804,766	16,113,042
Sind †	46,986	8,210,910	8,513,435
Aden †	80	43,974	46,165
Burma	280,889	10,490,624	12,115,217
Central Provinces and Berar	99,823	11,971,452	13,916,808
Central Prov. ‡	82,057	9,217,436	10,859,146
Berar ‡	17,776	2,754,016	3,057,162
Coorg	1,582	180,607	174,976
Madras (Pres.)	142,380	38,229,654	41,405,404
North-West Frontier Province	18,418	2,041,534	2,196,993
Punjab (incl. Delhi Province)	99,779	20,330,837	19,974,956
United Provs. of Agra and Oudh	107,267	47,692,227	47,182,044
Agra §	88,109	34,859,109	34,824,044
Oudh §	24,158	12,833,168	12,558,004
British India	1,098,074	281,605,940	244,267,542
<i>Native States and Agencies</i>			
Assam State (Manipur) ..	8,456	284,456	346,222
Baluchistan Sta. ...	80,410	428,640	420,291
Baroda State	8,182	1,952,692	2,082,798
Bengal States	5,398	740,299	822,565
Bihar and Orissa States	28,648	3,314,474	3,945,209
Bombay States	63,864	6,908,559	7,411,675
Central India Ag. ...	77,367	8,497,805	9,856,980
Central Prov. Sta. ...	81,174	1,681,140	2,117,002
Hyderabad State	82,698	11,141,142	18,374,676
Kashmir State	84,432	2,905,578	3,158,126
Madras States	10,549	4,188,086	4,811,841
Cochin †	1,361	812,025	918,110
Travancore †	7,129	2,952,157	3,428,975
Mysore State	29,475	5,589,399	5,806,193
N.-W. F. Prov. (agencies, etc.) ..	25,500	83,962	1,622,094
Punjab States	86,551	4,424,398	4,212,794
Rajputana Agency ..	128,987	9,858,366	10,530,432
Sikkim	2,818	59,014	87,920
United Provs. Sta. ...	5,079	802,097	832,086
Native States... ..	709,588	62,755,116	70,888,854
Total India	1,802,657	294,361,056	315,156,396

* Included in the Bihar and Orissa Province. † Included in the Bombay Presidency. ‡ Included in the Central Provinces and Berar. § Included in the United Provinces. ¶ Included in the Madras States.

The population of French and Portuguese India is not shown in the table. The Portuguese census of Dec. 31, 1910, returned a population of 604,930, and the French census of March 10, 1911, 282,472. Geographically a part of India are the Himalayan independent states Nepal and Bhutan. The estimated population of Bhutan is 250,000. Estimates of Nepal's population vary widely, but 3,000,000 is as plausible a figure as any. If these figures be included, the population of Indian territory becomes about 319,294,000. If Burma and Aden be excluded

as not being geographically a part of India, the total amounts to about 303,133,000. But, owing to our ignorance of the actual population of Nepal, these totals, even as approximations, are doubtful.

In the decade 1891-1901, the increase of population in India was 2.5 per cent, the increase in British India being 4.7, while in the Native States there was a decrease of 5.0. In the following decade, there was an increase of 7.1 per cent for India, British India showing an increase of 5.5 per cent, and the Native States 13.0 per cent. In 1911, about 78 per cent of the population was in British India, and about 22 per cent in the Native States. The total number of males in 1911 was 161,338,935, and of females 153,817,461. The urban population numbered 29,748,228, and the rural 285,408,168. The census shows the population as to civil condition in the case of 312,643,693 persons—160,001,322 males and 152,642,371 females; of these, 78,384,686 males and 52,616,947 females were unmarried; 72,006,881 and 73,704,162 married; 8,709,755 and 26,421,262 widowed (including divorced).

The distribution of population according to linguistic families was as follows at the 1911 census: I. Vernaculars of India. A. Malayo-Polynesian (number of languages spoken 2), number of persons 6179. B. Austro-Asiatic: (a) Mon-Khmer (7), 555,417; (b) Munda (16), 3,843,223. C. Tibeto-Chinese: (a) Tibeto-Burman (121), 10,932,775; (b) Siamese-Chinese (20), 2,039,737. D. Dravidian: (a) Dravida (11), 37,094,393; (b) Intermediate language (1), 1,527,157; (c) Andhra (3), 24,097,411. E. Indo-European or Aryan (37), 232,822,511. F. Unclassified (2), 29,618. G. Language not returned, 460. Total, 220 languages, 312,948,881 persons. II. Vernaculars of other Asiatic countries and Africa. H. Indo-European (2), 57,041. I. Semitic (3), 43,570. J. Hamitic (3), 7024. K. Caucasian (1), 20. L. Mongolian (4), 115,350. M. Malayo-Polynesian (1), 53. N. Bantu (3), 52. Total, 17 languages, 223,110 persons. III. European languages. O. Indo-European (24), 321,201. P. Basque (1), 5. Q. Mongolian (2), 17. R. Language not returned, 1. Total, 27 languages, 321,224 persons. IV. Language not recorded, 1,663,181 persons. Grand total as shown by the census of 1911, 264 languages, 315,156,396 persons.

Languages in order of prevalence in 1911 were: Hindi (E), 82,003,235; Bengali (E), 48,367,915; Telugu or Andhra (D), 23,542,861; Marathi (E), 19,806,636; Tamil (D), 18,128,365; Panjabi (E), 15,876,758; Rajarthani (E), 14,067,590; Western Hindi (E), 14,037,882; Gujarati (E), 10,682,248; Kanarese (D), 10,525,739; Oriya (E), 10,162,321; Burmese (C), 7,893,504; Malayalam (D), 6,792,277; Western Panjabi (E), 4,779,138; Sindhi (E), 3,669,935; Eastern Hindi (E), 2,423,392; Santali or Har (B), 2,138,015; Pashto (E), 1,554,465; Assamese (E), 1,533,822; Gond (D), 1,527,157; Western Pahari (E), 1,526,475; Kashmiri (E), 1,180,632; Karen (C), 1,067,464; Shan (C), 898,832; Kurukh or Oraon (D), 800,328; Mundari (B), 599,580; Tulu (D), 563,543; Kandh or Kui (D), 530,476; Baloch (E), 398,294; Ho (B), 420,108; Bihari (E), 398,294; Arakanese (C), 389,831; Manipuri, Meithei, Kathe, or Ponnu (C), 313,794; English (O), 303,515, etc. At the 1911 census, occupation was recorded

in the case of 313,470,014 persons. The following figures indicate the number of persons supported by the several means of livelihood: A. Production of raw materials: (1) Exploitation of the surface of the earth, 226,550,483; (2) extraction of minerals, 529,609; total, 227,080,092. B. Preparation and supply of material substances: (1) Industry, 35,323,041; (2) transport, 5,028,978; (3) trade, 17,839,102; total, 58,191,121. C. Public administration and liberal arts: (1) Public force, 2,398,586; (2) public administration, 2,648,005; (3) professional and liberal arts, 5,325,357; (4) persons living principally on their income, 540,175; total, 10,912,123. D. Miscellaneous: (1) Domestic service, 4,599,080; (2) insufficiently described occupations, 9,236,217; (3) unproductive, 3,451,381; total, 17,286,678. Grand total, 313,470,014.

The 1911 census returned the population of the larger cities as follows: Calcutta (Bengal), 896,067 (including Howrah and other suburbs, 1,222,313); Bombay (Bombay), 979,445; Madras (Madras), 518,660; Hyderabad (Hyderabad), including Secunderabad, Bolaram, and the Residency Bazaars, 500,623; Rangoon (Burma), 293,316; Lucknow (United Provinces), 259,798; Delhi (in Punjab in 1911, but in Delhi province since 1912), 232,837; Lahore (Punjab), 228,687; Ahmedabad (Bombay), 216,777; Benares (United Provinces), 203,804; Bangalore (Mysore), including civil and military station, 189,485 (Bangalore city alone, 88,651); Agra (United Provinces), 185,449; Cawnpore (United Provinces), 178,557; Allahabad (United Provinces), 171,697; Poona (Bombay), 158,856; Amritsar (Punjab), 152,756; Karachi (Sind, Bombay), 151,903; Mandalay (Burma), 138,299; Jaipur (Rajputana), 137,098; Patna (Bengal, now in Bihar and Orissa), 136,153; Madura (Madras), 134,130; Bareilly (United Provinces), 129,462; Srinagar (Kashmir), 126,344; Trichinopoly (Madras), 123,512; Meerut (United Provinces), 116,227; Surat (Bombay), 114,868; Dacca (Bengal), 108,551; Nagpur (Central Provinces and Berar), 101,415; Jubbulpore (Central Provinces and Berar), 100,651. At the time of the census, plague was prevalent in Cawnpore, and many of the inhabitants were absent. A new census taken after the epidemic had subsided showed an increase of about 17,000.

RELIGION. At the 1901 census religion was returned in the case of 294,361,056 persons; at the 1911 census, 313,547,840 persons. The following table shows population by religion and the proportion per 10,000:

	1901		1911	
	No.	Prop.	No.	Prop.
Hindu:				
Brahmanic	207,050,557	7.084	217,337,943	6.981
Arya ..	92,419	8	243,445	8
Brahmo.	4,050	0.14	5,504	0.18
Sikh	2,195,389	75	3,014,466	96
Jain	1,384,148	45	1,248,182	40
Buddhist ..	9,476,759	322	10,721,453	342
Parsi	94,190	3	100,096	3
Mohammedan	62,458,077	2.122	66,647,299	2.126
Christian ..	2,923,241	99	3,876,203	124
Jewish	18,228	0.6	20,980	0.7
Animist	8,584,148	292	10,295,168	328
Minor or not recorded	129,900	4	37,101	1
Total ..	294,361,056	10,000	313,547,840	10,000

EDUCATION. The 1911 census recorded literacy in the case of 313,415,389 persons, as shown in the following table:

Religion	Total	Males	
		Literate	Literate in English
Hindu	110,865,731	11,228,134	1,018,596
Sikh	1,784,778	184,168	11,490
Jain	643,558	818,585	13,030
Buddhist	5,286,142	2,184,381	21,767
Parsi	51,123	39,995	25,334
Mohammedan	34,709,865	2,389,766	176,051
Christian	2,010,724	588,570	252,591
Animist	5,088,241	58,838	1,521
Minor and unspecified	28,818	6,388	2,981
Total males	160,418,470	16,988,815	1,518,861
		Females	
		Literate	Literate in English
Hindu	106,720,714	814,810	23,659
Sikh	1,279,667	17,280	238
Jain	604,629	24,120	209
Buddhist	5,435,086	317,838	1,383
Parsi	48,978	31,218	8,347
Mohammedan	31,888,812	137,807	8,940
Christian	1,865,472	252,295	112,643
Animist	5,129,803	2,987	74
Minor and unspecified	29,263	2,908	1,538
Total females	152,996,919	1,600,763	152,026
Total	313,415,389	18,589,578	1,670,887
Corresponding totals for 1901:			
Males	149,442,106	14,154,602	1,021,319
Females	143,972,800	883,565	108,912
Total	293,414,906	15,038,167	1,125,231

Literacy as returned by the 1911 census in British territory and the Native States was as follows:

	Total	Males	
		Literate	Literate in English
British ter.	124,834,850	14,121,860	1,338,694
Native States	85,583,620	2,817,455	179,667
Total males	160,418,470	16,938,815	1,518,361
		Females	
		Literate	Literate in English
British ter.	119,354,866	1,324,896	133,217
Native States	33,642,058	275,867	18,809
Total females	152,996,919	1,600,763	152,026
Total	313,415,389	18,539,578	1,670,387

Increased attention is being given by the Department of Education to primary, commercial, and technical instruction. In 1914, educational institutions (exclusive of those in British Baluchistan) numbered about 186,000, with 7,532,000 pupils, including 1,104,000 females.

AGRICULTURE. In British territory in 1913-14, the reported area cropped was about 247,000,000 acres, of which about 9 per cent was under wheat, 31 per cent under rice, and 37 per cent under the food grains and pulse, 6 per cent under oilseeds, and 7 per cent under jute, cotton, and other fibres. Other important crops are sugar, tea, and tobacco. Area in hectares and yield in thousands of metric quintals, with yield per hectare in 1913-14, are reported as follows (the figures for 1914-15 are subject to revision):

	Hectares		1000 Qs.		Qs. ha.
	1913-14	1914-15	1913-14	1914-15	
Wheat ..	11,542,333	13,042,836	84,828	104,838	7.3
Cotton ..	6,145,875	4,794,244	9,498	.....	1.5
Rice ..	30,829,048	30,120,737	437,558	.....	14.2
Linseed ..	1,226,586	1,847,139	3,924	4,011	3.2

Live stock in British territory and the Native States respectively is reported as follows for 1914: bulls and bullocks, 47,527,324 and 3,948,912; cows, 36,555,287 and 4,391,217; bull buffaloes, 5,256,077 and 245,696; cow buffaloes, 12,979,142 and 1,519,487; young stock (calves and buffalo calves), 40,958,726 and 3,896,289; sheep in British territory, 23,091,955; goats in British territory, 30,672,585; sheep and goats in Native States, 8,306,616; horses and ponies, 1,643,374 and 175,499; mules and donkeys (mostly the latter), 1,587,389 and 181,121; camels, 491,592 and 54,362.

COMMERCE. The foreign sea-borne trade of India is given in the table below for years ended March 31st, in thousands of pounds sterling. The table shows imports of private merchandise and treasure, government stores and treasure, and total imports; exports of foreign and domestic produce, government stores, and government and private treasure, and total exports:

Imports:	1911-12	1912-13	1913-14	1914-15
Private mdse.	92,888	107,327	122,165	91,940
Gov't stores	8,654	8,744	5,378	4,668
Total mdse.	96,037	111,071	127,538	96,608
Private treasure....	35,615	34,182	24,414	14,514
Gov't treasure.....	32	7,089	4,546	25
Total treasure...	35,647	41,221	28,960	14,539
Total imports...	131,684	152,292	156,498	111,147
Exports:				
Indian produce....	147,879	160,899	162,801	118,282
Foreign produce ...	4,018	8,160	8,118	2,738
Gov't stores	96	86	86	398
Total mdse.	151,993	164,145	116,005	121,418
Private treasure ...	6,908	4,697	4,701	2,202
Gov't treasure.....	8	2,391	21	1,324
Total treasure ...	156,916	7,088	4,722	3,526
Total exports...	158,909	171,233	170,727	124,944
Net imps. treas....	28,731	34,133	24,238	11,018
Net exps. mdse....	55,956	53,075	38,467	24,810
Excess exports...	27,225	18,941	14,229	18,797

In the year 1913-14, both imports and exports of merchandise were of unprecedented magnitude, but the outbreak of the war during the following fiscal year caused the cessation of trade with enemy countries, and the curtailment of trade with allied and neutral countries. The decline in import values is seen in nearly every article of importance. Cotton goods declined by about £12,000,000, iron and steel by over £4,000,000, and sugar by about £3,000,000. In the export trade, raw jute declined by about £12,000,000, grain, pulse, and flour by £11,000,000, oilseeds by £7,400,000, raw cotton by £5,000,000, cotton yarn and knit goods by nearly £3,000,000, and raw hides and skins by £2,600,000. Some of the principal imports for home consumption, and exports of Indian produce, are shown in the table below, with values for 1914-15 in thousands of pounds sterling:

Imports:	1000 £	Exports:	1000 £
Cotton goods.....	30,098	Cotton (raw)	22,304
Cotton yarn.....	2,568	Jute mfrs.	17,213
Sugar	7,022	Rice	11,439
Railway material..	6,722	Tea	10,347
Iron and steel.....	6,518	Seeds	9,769
Machinery, etc....	4,027	Jute (raw)	8,607
Mineral oil.....	2,938	Wheat and flour...	6,159
		Cotton yarn and mfrs.	5,840
Copper	1,849		

Imports:	1000 £	Exports:	1000 £
Hardware, etc.....	1,707	Hides and skins (raw)	5,207
Provisions	1,405	Leather	3,173
Silk goods.....	1,298	Barley, millet, pulse, etc.	1,768
Woolen goods.....	1,256	Wool (raw)	1,579
Liquors	1,318	Opium	1,176
Spices	1,146	Coffee	1,108
Instruments, etc..	891	Dyes, etc.	1,078
Paper, etc.....	879	Lac	1,071
Fruits and veg- etables	761	Oilcake	709
Silk (raw)	756	Oils	694
Matches	758	Hemp (raw)	663

Percentages of imports and exports of merchandise (private sea-borne trade) by countries in 1914-15: United Kingdom, 67.3 per cent of the imports and 31.5 per cent of the exports; Germany, 3.4 and 5.7; United States, 3.4 and 9.8; China, 1.1 and 2.3; Hongkong, 0.7 and 2.4; Japan, 3.2 and 8.8; France, 1.3 and 5.0; Belgium, 1.2 and 3.0.

The foreign land trade in 1914-15 amounted to £7,629,000 imports and £6,330,000 exports.

Export of wheat has been prohibited from April 1, 1915, to March 31, 1916, except under authority of the crown. Also export of wheat flour is forbidden until March 31, 1916, except by permission of the minister of customs. By an order of March 13, 1915, the export of corn is prohibited to ports in Europe, and Mediterranean and Black Sea ports other than those of Great Britain, Russia (except Baltic ports), Belgium, France, Spain, and Portugal. The export of rice has been prohibited where destined for Sweden, Norway, Italy, Denmark, Netherlands, and its colonies, Egypt, and neutral ports on the Mediterranean and Red seas. By an order of May 8, 1915, the export of raw cotton has been prohibited to foreign ports in Europe, and on the Mediterranean and Red seas, other than those of France, Russia (not including Baltic ports), Spain, and Portugal.

SHIPPING. In the foreign trade in 1913-14, there were entered and cleared at the ports of British India 8617 vessels, of 17,386,408 tons, of which 53 per cent from or to the United Kingdom and British possessions. The chief ports are Calcutta and Bombay, which have about 70 per cent of the foreign trade; next in importance are Karachi, Rangoon, and Madras.

COMMUNICATIONS. The length of state and private railway open to traffic March 31, 1914, in British India and the Native States, was 34,656 miles; on March 31, 1915, 35,285 miles. On the latter date, there were under construction 2232 miles. The capital at the end of the fiscal year 1914 was £369,265,000; 1915, £383,912,000. Net earnings in 1914-15, £18,453,000, as compared with £20,394,835 in 1913-14 and £20,309,078 in 1912-13. Telegraph wires in India March 31, 1914, 322,000 miles. Post offices March 31, 1912, 18,801. See *Railways*, below.

FINANCE. The standard unit of value is the British pound sterling (par value, \$4.86656), but the current coin is the rupee (par value, 32.444 cents), 15 rupees to the pound. For British India, the gross revenue, and the expenditure charged against revenue, in thousands of pounds sterling, were as follows for years ended March 31 (revised estimates for 1914-15):

	1905-06	1908-09	1911-12	1913-14	1914-15
Rev....	70,845	69,762	82,836	86,863	85,207
Exp....	68,754	73,499	78,895	83,755	82,895

The table below shows the principal sources of gross revenue for fiscal years, in thousands of pounds sterling (revised estimates for 1914-15):

	1911-12	1912-13	1913-14	1914-15
Land revenue	20,765	21,282	21,892	21,057
Opium	5,961	5,125	1,625	1,566
Salt	8,391	8,334	8,446	8,772
Stamps	4,815	5,069	5,818	5,045
Excise	7,610	8,278	8,894	8,809
Provincial rates	549	552	180	87
Customs	6,469	7,197	7,558	6,866
Income tax	1,653	1,742	1,950	2,009
Forest	1,952	2,163	2,280	1,999
Registration	446	482	519	492
Tribute (Native Sts.)	595	624	617	607
Total	54,205	55,839	53,729	51,759
Interest	1,449	1,474	1,352	1,022
Post office	2,134	2,262	3,559	3,519
Telegraphs	1,087	1,174		
Mint	367	487	840	58
Civil depts.	1,238	1,335	1,408	1,483
Miscellaneous	813	765	772	760
Railways (net)	15,982	17,372	17,626	15,268
Irrigation	8,980	4,411	4,713	4,707
Other civil pub. works	327	355	298	266
Military receipts....	1,843	1,888	1,870	1,816
Grand total.....	82,836	86,663	85,207	80,158

The table below shows the principal items of gross expenditure charged against revenue for fiscal years (revised estimates for 1914-15), in thousands of pounds sterling; the first item, direct demands on the revenue, includes refunds and drawbacks, assignments and compensations, together with collection charges, which comprehend land revenues, excise, customs, etc., with production costs in the salt and opium monopolies:

	1911-12	1912-13	1913-14	1914-15
Direct demands	8,670	8,653	9,274	9,019
Interest	2,038	1,811	1,516	1,481
Post office	2,008	2,027	3,273	3,290
Telegraphs	1,094	1,106		
Mint	117	142	133	139
Civil depts.	16,466	16,689	17,934	18,989
Misc. civil charges..	4,899	4,926	5,404	5,400
Famine relief *	1,000	1,000	1,000	1,000
Railway account †	12,104	12,568	12,836	13,355
Irrigation	3,175	3,302	3,532	3,742
Other public works..	5,454	6,064	7,010	7,011
Military services....	20,902	20,953	21,265	21,822
Total ‡	78,895	83,755	82,895	82,943

* And insurance. † Railway revenue account; the working expenses are treated as deduction from revenue instead of as expenditure. ‡ These totals are adjusted to compensate for net excess on provincial allotments amounting to £969,000 in 1911-12, £4,514,000 in 1912-13, and a net deficit of £282,000 in 1913-14 and £2,555,000 in 1914-15.

Net revenue and net expenditure in 1912-13 were £60,362,000 and £57,254,000 respectively the surplus being £3,108,000; in 1913-14, £57,762,000 and £55,450,000, surplus £2,312,000; revised estimate for 1914-15, £52,544,000 and £55,330,000, deficit £2,786,000.

Besides expenditure charged against revenue there was a capital expenditure in 1913-14 of £10,483,000 on state railways, £1,282,000 on irrigation works, and £447,000 in connection with the new capital at Delhi.

On March 31, 1915, the debt stood at £284,249,000, consisting of the sterling debt of £183,565,000 and the rupee debt of £100,684,000. Miscellaneous obligations amounted to about £29,855,000, besides the charge of £929,000 for various railway annuities. There was also an

outstanding loan of £7,000,000 from the Gold Standard Reserve. In consequence of the conditions caused by the war, it was necessary in 1914-15 to borrow largely in excess of original anticipations.

GOVERNMENT. The King of Great Britain and Ireland is Emperor of India. In England, the administration of Indian affairs is intrusted to the secretary of state for India (a member of the British cabinet). The Marquis of Crewe as secretary of state for India was succeeded by Austen Chamberlain upon the reorganization of Mr. Asquith's ministry in June, 1915. In India, the executive authority resides in the "Government of India," that is, the governor-general in council. In 1915, the governor-general, who is appointed by the crown for five years, was Baron Hardinge of Penhurst, who succeeded the Earl of Minto in 1910. About the end of 1915 it was announced that Baron Chelmsford had been appointed to succeed Baron Hardinge. Baron Chelmsford was Governor of Queensland in 1905-09, and of New South Wales in 1909-13. The council consists of six members, appointed by the crown, and of the commander-in-chief of the army in India. The governor-general's legislative council, in addition to ex-officio members, consists of 28 official and 32 nonofficial members (including 27 elected). There are similar legislative councils in Bengal, Bombay, Madras, Bihar and Orissa, the United Provinces, the Punjab, the Central Provinces and Berar, Assam, and Burma. British India is divided into 15 local governments and administrations, viz.: under governors, the presidencies of Bengal, Bombay, and Madras; under lieutenant-governors, the provinces of Bihar and Orissa, the Punjab, the United Provinces of Agra and Oudh, and Burma; under chief commissioners, the Central Provinces, and Berar, Ajmer-Merwara, Assam, Coorg, British Baluchistan, the North-West Frontier Province, Delhi, and the Andamans and Nicobar.

The Native States are governed by their princes, ministers, or councils, but the government of India, through British residents or agents, exercises control in varying degrees, and does not permit the states to maintain external relations.

RAILWAYS. The administration report of the railways of India covered the financial year ending March 31, 1915. The total capital expended on Indian railways at the end of the financial year was over £313,000,000, and the current expenditures were less than the annual grant, owing to the outbreak of the war, and in order to avoid any possible embarrassment. The railways open to traffic consisted of 35,285 miles, composed of 17,827 miles of 5 foot 6 inch gauge, 14,552 miles meter gauge, 2402 miles of 2 foot 4 inch gauge, and 504 miles of 2 foot gauge. With the completion of the Hardinge Bridge, opened March 4, 1915, a broad gauge line was laid from a point seven miles north of Sara to Santahar, the first junction station on the meter gauge line north of the river, a distance of 45 miles. It was proposed to convert Adam's Bridge into a solid embankment, so that an all-rail connection between India and Ceylon could be made. Likewise, on the South Indian Railway, it was proposed to construct a causeway from Dhanushkodi to Talaimannar, a distance of 20.05 miles, of which 7.19 miles would be on the dry land of the various islands, and

1,286 miles would be on the water. This would involve an interesting construction of reinforced concrete piles for the sea section, and for the land construction low banks of sand pitched with coral. The total cost of the causeway and the works at the two terminals was stated as approximately £739,926.

Double tracking was in process for over 400 miles of route mileage on which second track, or third or fourth tracks, were being added. This included 172 miles of second track between Rohri and Kotri on the Northwestern, which would, when completed, give a double line from Karachi to Lodhran, 524 miles. At Nagpur a large new hump yard for freight was under construction, and 92 new stations were in course of building on open line during the year. Nineteen important bridges were being repaired with new girders, and important schemes for the improvement of water supply were also on hand. During the year the results secured from the use of superheaters on the locomotives were very striking, involving a saving in fuel of between 17 and 25 per cent, and of water of from 15 to 35 per cent. Oil fuel trials were still in progress, as the opening of the Persian oil fields made possible the introduction of oil fuel on the west coast of India in competition with coal. The record of railway accidents for the year was: 6 passengers killed in train accidents, 140 injured, and 36 employees killed and 160 injured. Other than train accidents: 407 employees killed and 699 injured.

On March 31, 1915, the length of line worked by the Bombay, Baroda, and Central India Railway Company was 3723½ miles. Of this mileage 1001½ miles were upon a 5½ foot gauge, 1827½ miles upon a meter gauge, and 29¼ miles upon a 2½ foot gauge. Of the broad gauge lines 257 miles were laid with double track, and of the meter gauge lines 26¼ miles were mixed gauge; the balance of the lines worked by the company (864¼ miles) are lines worked for native states or other companies. Of these, 223½ miles are of a 5½ foot gauge, 394 miles of a meter gauge, and 247¼ miles of a 2½ foot gauge. There were 851 locomotives, 2769 cars used for passenger traffic, and 18,274 cars used for freight upon the Bombay, Baroda, and Central India system at the close of March, 1915.

The new Southern Shan States Railway, lying north of Burma and Siam, was being built to develop a rich agricultural section and to form a link in the future connection with the railway system of China, and is the most eastern line of the Indian railway system. The new line opened in 1915 is of meter gauge and extended eastward from Thazi, on the Burma Railways (306 miles north of Rangoon), to Aunghban, 70 miles, and was to be extended 33 miles further to Yawngwhwe. Beyond this surveys had been made as far as Feng Tung, about 270 miles further. At Thazi the elevation is 525 feet above sea level, rising to 1546 feet at Lebyin (38 miles), where commences a 4 per cent grade 17 miles long, with two switchbacks. The summit elevation is 4603 feet. Steep grades will be required to bring the line down to Yawngwhwe at an elevation of 2903 feet. The sharpest curves are 17 degrees, with transition spirals, and the heavy grades (4 and 2½ per cent) are compensated for curvature. Locomotives of the Mallet type (0:6:6:0) are used on the heavy grades.

Progress in railway construction in India dur-

ing the year include surveys by the Eastern Bengal State Railway of the 36 miles between Serajgunj and Bogram, and by the Bhavnagar Durbai of a meter gauge railway, about 56 miles long, from Savarkundla via Dongar to Mahuva, with a branch from Dongar to Port Albert Victoria, and the construction by the Junagadh of a line, 60 miles long, between Varavaland and Una.

HISTORY

UNREST IN INDIA. At intervals throughout the year, sensational reports of insurrections in India were given credence in the German press, and, to a lesser extent, in American journals. A few of the most startling reports were officially denied by the British India Office, however, and it was repeatedly asserted that the disturbances in India, where they were not sheer fabrications of German or Turkish origin, were local outbreaks, engineered by small bands of agitators, and without effect upon the loyalty of the mass of the population. In the face of such conflicting statements, the historian can only state the fact that, whatever interpretation be placed upon them, it is at any rate certain that numerous riots and mutinies occurred in India. The riots which greeted the return of a shipload of angry Sikhs, who had been refused permission to settle in Canada, were chronicled in the YEAR BOOK for 1914, p. 358. In February, 1915, the Sikh leaders who had instigated the riots were sentenced to death by a court at Firozpur, in the Punjab. On February 15th announcement was made of a mutiny which had occurred among the Bengalese troopers of the 5th Light Infantry, at Singapore. The mutineers, it seemed, had first subdued the sections of the regiment which had remained loyal, and then had made themselves masters of the city, terrorizing the populace. The timely arrival of marines from warships which had just entered the harbor put an end to the mutiny. According to the report issued, February 23, by the Colonial Office at London, 35 persons were killed in the Singapore mutiny, including 6 officers, 15 mutineers, and 14 civilians. Early in March an insurrection was reported to have taken place at Cawnpore; but the censor prevented the publication of details regarding the incident. About the same time mutinous manifestations were reported from Rangoon, where a regiment of Pathans was stationed. Nine of the Rangoon mutineers were shot and 200 imprisoned, according to the dispatch. Riots also occurred in the central provinces of India. Consequently the government was compelled to declare martial law. The native press was placed under strict surveillance. Every effort was made to detect and arrest the Mohammedan agitators, who, it was alleged, were endeavoring to incite their coreligionists to rebellion, in obedience to the Turkish Sultan's proclamation of the *jehad*, or holy war, against Great Britain. Bulletins issued by the India Office asserted that the *jehad* was being preached in India with the support of German gold and German influence. As a result of the widespread disturbances of February and March, a Defense of India Bill was passed by the Governor-General's Council, giving the military authorities special powers for the suppression of lawlessness. In May, after a thorough investigation of the matter, the Government of India was reported to have reached

the conclusion that the outbreaks which had recently occurred were in large part due to the activity of agitators from America. Shortly after the outbreak of the war, it was stated, 5000 former East Indians met at Sacramento to protest against the refusal of Canada to receive Indian immigrants as fellow-citizens of the British Empire. Smaller meetings were simultaneously held in other parts of the United States. Funds were subscribed for the establishment of a revolutionary Hindu newspaper. Acting on the theory that the removal of so many loyal Indian troops to European battlefields offered a splendid opportunity for the inauguration of a rebellion against British rule, a party of 70 Indians was alleged to have sailed from San Francisco on August 29th. First they had stirred up disorders among the Sepoys stationed at Hongkong. Then they had visited Singapore, where they caused the mutiny in February. Subsequently the band had separated and scattered throughout the Indian provinces, inciting insurrections and mutinies wherever they went. A general rising was planned, it seemed, to culminate on February 21st with an attack upon the arsenal at Lahore. Government agents, however, learned of the conspiracy and arrested the leaders at Lahore in time to avert the attack upon the arsenal. According to this official summary of the mutinous outbreaks in the spring, in short, the trouble was chiefly or wholly due to a handful of revolutionaries from America. In the same vein, a native Indian prince, Jagajit Singh Bahadur, maharajah of Kapurthala, visiting New York in May, made the following statement: "There has been some trouble with small sections of troops in isolated districts in India, but when I left Bombay in March the bulk of the people in India and the native army were loyal to the Empire. Some of the sons of the noblest families in India are fighting with the British troops in France. The reports of rioting in India have been exaggerated." Nevertheless, wireless dispatches from Germany during the summer and fall continued to assert the existence of serious disaffection in India. In July, it was affirmed, a mutiny occurred in Lahore; in September, a riot at Travancore. Further reports of disturbances in Mysore, followed by the deposition of the maharajah, were published in October and November. The fact that on November 18th the Mohammedan festival of the Muharram was celebrated with comparatively few disorders, was regarded by British officials as a reassuring index of the loyalty of the masses. At the same time, however, Indian students in the United States were alleged to be planning to instigate a general revolt in India.

INDIA AND THE WAR. The loyalty and intrepidity of the Indian troops which had been sent to fight with the Allied armies in Europe, was a source of profound gratification to the British public, since the conduct of the Indians in Europe seemed to disprove the rumors of disloyalty in India. At the opening of the Viceroy's Council at Delhi on January 13th, Lord Hardinge declared that 200,000 Indian troops were serving in the active British forces at the front. On January 27th the British government announced that the Victoria Cross for heroic bravery had been conferred upon two Hindus. One of the soldiers thus honored had distinguished himself in hand to hand fighting

in the British trenches; the other was the sole survivor of a machine gun section which had gallantly repulsed an enemy assault. In July the Victoria Cross was awarded to a third Indian, Jemadir Mir Dost, for gallantry at Ypres. In September, the Gaekwar of Baroda, who had previously offered his troops and financial resources to aid the British in the war, contributed five lakhs of rupees (\$160,000) to provide aeroplanes for use in France.

POLITICAL AFFAIRS. On February 22nd the retirement of Sir Krishna Govinda Gupta from the Council of India was announced. Lord Crewe, secretary of state for India, appointed as Sir Krishna's successor Sardar Daljit Singh, the great uncle of the maharajah of Kapurthala. On March 2nd Sir W. S. Meyer, minister of finance, presented his annual financial statement to the Legislative Council. The minister estimated that, for the fiscal year 1915-16, the deficit would equal or exceed the deficit for the current year, £2,750,000. In September the viceroy accepted a resolution of the Imperial Legislative Council asking that India be represented officially at the next Imperial Conference, which was expected to meet in the near future.

MARAUDING TRIBESMEN. On March 31st the government issued the following statement regarding an engagement with a band of marauding tribesmen: "Ten thousand tribesmen, composed mainly of Zadraus, collected with a view to attacking Tochi, near the Miranshah post. Government troops under Brigadier-General Fane engaged the natives at dawn on March 26th, repulsing them completely, killing 200 and wounding 300. The band disappeared immediately."

INDIANA. POPULATION. The estimated population of the State on July 31, 1915, was 2,798,142. The population in 1910 was 2,700,876.

AGRICULTURE. The acreage, production, and value of the principal crops estimated by the United States Department of Agriculture in 1914-15, were as follows:

		Acreage	Prod. Bu.	Value
Corn	1915	5,025,000	190,950,000	\$97,384,000
	1914	4,949,000	163,317,000	94,724,000
Wheat	1915	2,750,000	47,300,000	48,246,000
	1914	2,485,000	43,239,000	44,586,000
Oats	1915	1,638,000	65,520,000	22,277,000
	1914	1,575,000	44,888,000	19,302,000
Rye	1915	150,000	2,400,000	1,968,000
	1914	99,000	1,614,000	1,372,000
Barley	1915	8,000	224,000	146,000
	1914	8,000	200,000	134,000
Potatoes	1915	75,000	7,125,000	3,990,000
	1914	75,000	6,000,000	3,360,000
Hay	1915	2,020,000	a 8,030,000	33,380,000
	1914	1,764,000	1,764,000	24,872,000
Tobacco	1915	13,500	b 11,840,000	828,000
	1914	13,500	12,150,000	1,094,000

a Tons. b Pounds.

LIVE STOCK. The United States Department of Agriculture estimated that on Jan. 1, 1916, and Jan. 1, 1915, horses numbered 854,000 and 854,000, valued at \$88,816,000 and \$97,356,000; mules numbered 95,000 and 86,000, valued at \$10,545,000 and \$10,062,000; milch cows numbered 672,000 and 646,000, valued at \$36,624,000 and \$35,530,000; other cattle numbered 728,000 and 693,000, valued at \$26,790,000 and \$24,394,000; sheep numbered 1,058,000 and 1,114,000,

valued at \$6,454,000 and \$6,016,000; swine numbered 4,167,000 and 4,167,000, valued at \$35,420,000 and \$42,920,000. The production of wool in 1915 and 1914 was 4,920,000 and 4,961,000 pounds respectively.

MINERAL PRODUCTION. The petroleum output of the State in 1914 showed an increase since 1904. The production amounted to 1,335,456 barrels, valued at \$1,548,042, compared with 956,095 barrels, valued at \$1,279,226 in 1913. This increase may be attributed chiefly to the pools in Sullivan County in the southern part of the State. The average price per barrel received for the petroleum declined from \$1.34 in 1913 to \$1.06 in 1914, which was higher than any previous year, with the exception of 1913, in the history of its production.

The coal produced in 1914 was 16,641,132 tons, having a value of \$18,290,928, compared with 17,165,671 tons, valued at \$19,001,881 in 1913. Of the nineteen coal producing counties, six showed an increase in 1914. There were, during the year, 44 fatal accidents in the coal mines of the State. The value of the total mineral production in 1914 was \$42,864,267, compared with \$46,502,633 in 1913.

EDUCATION. The total school population in 1914-15 was 768,622. The total enrollment in the public schools was 552,927. The average daily attendance was 452,765. The teachers numbered 19,220. The average annual salary of teachers, male and female, was \$578.61. The total school expenditures in 1915 amounted to \$21,917,649.

FINANCE. The report of the State Treasurer shows a balance in the treasury on Sept. 30, 1913, of \$378,271. The total receipts from all sources, including this balance, were on Sept. 30, 1914, \$12,922,278. The expenditures for the fiscal year left a balance in the treasury on Sept. 30, 1914, of \$649,964.

CHARITIES AND CORRECTIONS. The State institutions include the State Hospitals for Insane at Logansport, Richmond, Evansville, and North Madison, State Soldiers' Home at Lafayette, Sailors' and Soldiers' Home at Knightstown, School for Feeble-minded Youth at Fort Wayne, Village for Epileptics at New Castle, Tuberculosis Hospital at Rockville, State School for the Deaf at Indianapolis, State School for the Blind at Indianapolis, Indiana State Prison at Michigan City, Indiana State Reformatory at Jeffersonville, Indiana Woman's Prison at Indianapolis, Indiana Boys' School at Plainfield, and Indiana Girls' School at Clermont.

TRANSPORTATION. The total railway mileage in the State on June 1, 1914, was 7359; of this, 4688 was main track line. On that date there were 45 companies either operating or leasing electric railways in the State.

POLITICS AND GOVERNMENT. The Legislature met in 1915 and passed several important measures. For mention of these, see articles ELECTION REFORM, LEGISLATION IN 1915, and LIQUOR REGULATION. A workmen's compensation law was passed by this session of the Legislature. For a discussion of its provisions see WORKMEN'S COMPENSATION. On June 22nd, 128 men were indicted by the Marion County Grand Jury at Indianapolis on charges of conspiracy to commit felonies, connected with the election laws of the State, and the laws against bribery and blackmail. Among these were several of the best known citizens of the State, including

Thomas Taggart, Democratic national committee man, Joseph E. Bell, mayor of the city, Samuel Perrott, chief of police, and Robert T. Metzger, Republican member of the Republican board of safety. All the indictments created a great sensation. While it had been reported for several months that a number of indictments were to be brought as a result of investigation, it was not thought men so high in political councils would be included. Among those indicted were members of the Democratic, Republican, and Progressive parties. The charges contained in the indictments, which numbered 48 counts, began previous to the election of May 5, 1914, and extended to the primary of May 5, 1915. The charges included election voting intimidations, false registrations, padding the tally sheets, stuffing the ballot boxes, illegal manipulations of voting machines, blackmailing of saloonkeepers and resort owners, bribes, and vote buying. Seven of the men indicted pleaded guilty, when arraigned in the court in Indianapolis on July 7th. These were M. Hughes, a political worker, Robert Board, also a political worker, Charles Gibbs, an election official, John W. Reed, a political official, Edward O'Leary and Bernard Lickelman, political workers. One hundred and thirteen others, including the most prominent persons, asked for a change of venue. Judge Collins of the Criminal Court, in response to this request, said that he would select five members from the Marion County bar from which list one would be chosen to try the case.

STATE GOVERNMENT. Governor, Samuel M. Ralston; Secretary of State, L. G. Ellingham; Auditor of State, William H. O'Brien; Treasurer, William B. Wollmer; Attorney-General, Thomas M. Honan; Superintendent of Public Instruction, Charles A. Greathouse.

JUDICIARY. Supreme Court: John W. Spencer, Douglas Morris, Charles E. Cox, Richard K. Erwin, Quincy A. Myers.

Appellate Court: Milton B. Hottell, Joseph H. Shea, Edward W. Felt, Fred G. Caldwell, Moses B. Lairy, Joseph G. Ibach.

STATE LEGISLATURE:

	<i>Senate</i>	<i>House</i>	<i>Joint Ballot</i>
Democrats	41	60	101
Republicans	8	39	47
Progressives	1	1	2
Democratic majority..	32	20	52

INDIANA, UNIVERSITY OF. A State institution for higher education, founded at Bloomington, Ind., in 1820. The total number in all departments in 1915 was 1772. The faculty numbered 190. There were no notable changes in the membership of the faculty during the year. The university received \$100,000 to establish the Waterman Research Fund. The productive funds in 1915 amounted to \$679,310. The library contained 101,300 volumes.

INDIANS. Conditions among the Indians in the United States were, on the whole, excellent during 1915. Improvements were made in plans for providing industrial and vocational schools, especially at the Carlisle School. In connection with Indian schools, the largest possible use has been made of the public schools in the several States convenient for the population, and the attendance of Indian pupils in the pub-

lic schools greatly increased during the year. Additional schools were constructed in Navajo County in Arizona to provide instruction for the Navajo and Papagos Indians in that State.

There were employed to look after the health of the Indians approximately 200 physicians. Six new hospitals were constructed, and plans were made for the erection of others. A vigorous campaign was waged for the eradication of tuberculosis and trachoma, the two principal diseases with which the Indian population is afflicted.

There was a marked increase in the number of Indians employed in farming during the year. Farms connected with the several schools on the reservation have been practically converted into demonstrating and experimental stations. At the experimental farm in southern Arizona there was developed a new type of cotton of the long staple Egyptian variety. To this was given the name of pima from the reservation on which it was cultivated.

Progress was made in examination of lands, belonging to the Indians, suitable for irrigation. There was a notable increase in the utilization of irrigation facilities by the Indians of the various reservations.

The allotment of the lands of Five Civilized Tribes in Oklahoma was continued during the year. Out of a total of 19,525,966 acres, 15,794,400 have been allotted. Several sales of unallotted lands were held during the year. There was collected for the Five Civilized Tribes from all sources \$1,854,871. These tribes had on deposit \$5,931,984. The revenue is largely from the sale of oil in lands owned by the members of these tribes. See ANTHROPOLOGY.

INDIA RUBBER. See RUBBER.

INDIGO. See AGRICULTURE.

INDO-CHINA. See under FRENCH INDO-CHINA.

INDUSTRIAL ACCIDENTS. See under LABOR LEGISLATION; and WORKMEN'S COMPENSATION.

INDUSTRIAL DISEASES. See OCCUPATIONAL DISEASES.

INDUSTRIAL RELATIONS, COMMITTEE ON. Early in November Chairman Frank P. Walsh of the United States Commission on Industrial Relations (see following article), announced that a new organization, to be called the Committee on Industrial Relations, was being organized for the purpose of continuing some of the activities of the previous commission. Associated with Mr. Walsh in this committee were 11 others, 7 of whom were labor leaders. They were: Amos R. E. Pinchot, Frederick C. Howe, Bishop C. D. Williams of Detroit, and Dante Barton, a Kansas City newspaperman; and the following labor leaders: John B. Lennon, James O'Connell, Austin B. Garretson, John P. White, John Fitzpatrick, Helen Marot, and Agnes Nestor. Basil M. Manly, director of research for the previous commission, and George P. West, who investigated the Colorado strike, and Otto F. Bradley of Wisconsin, were retained as experts. Headquarters were established in Washington. It was the purpose of the committee to further the organization of labor and in all possible ways to establish greater equality and a reduction of exploitation in industrial relations. See also ARBITRATION AND CONCILIATION, *Committee on Industrial Relations*.

INDUSTRIAL RELATIONS COMMIS-

SION. This commission was created by Congress on Aug. 25, 1912, and its life limited to three years. On June 28, 1913, President Wilson named the following to constitute the commission, later confirmed and organized in October, 1913: Representing the public: Frank P. Walsh, chairman, attorney for the Board of Public Welfare, Kansas City, Mo.; Prof. John R. Commons, economist, of the University of Wisconsin; and Mrs. J. Borden Harriman of New York City, member of the National Civic Federation. Representing employers: Frederick A. Delano, Chicago, railway manager (on March 17, 1915, Mr. Richard H. Aishton of Illinois was appointed to fill out the unexpired term of Mr. Delano, who resigned); Harris Weinstock, San Francisco, merchant and publicist; and S. Thurston Ballard, Louisville, Ky., manufacturer. Representing organized labor: John B. Lennon, Philadelphia, treasurer of the American Federation of Labor; Charles O'Connell, District of Columbia, head of the National Trades Department of the same federation; and Austin B. Garretson, Cedar Rapids, Iowa, president of the Order of Railroad Conductors. A total appropriation of \$500,000 was made for this commission. The life of the commission expired on August 25th and at that time it made public summaries of its findings. The reports were later published in full.

ORGANIZATION. The work of the commission was carried on under two general departments, known as the Division of Public Hearings and the Division of Investigation and Research. The first of these divisions conducted hearings in Washington, New York, Paterson, Philadelphia, Chicago, Lead (S. Dak.), Butte, Portland, Seattle, San Francisco, and Los Angeles between April, 1914, and January, 1915. Numerous leaders of labor organizations, of employers' associations, of corporations, of civic organizations, and of public institutions were heard. A vast amount of personal testimony was elicited and thus the interest of the American public in labor questions was greatly stimulated.

The Division of Investigation and Research was under the general direction of Mr. Charles McCarthy, head of the legislative library of the State of Wisconsin, until early in the year, when he was succeeded by Basil M. Manly. It carried on its work under 10 separate headings: 1. The sub-division on legal and legislative was in charge of Edwin Witte. It gave special attention to injunctions and boycotts, making a study of laws of special cases and of actual practices. Special investigators took up the relation of the military to the civil power and the use of martial law and the writ of habeas corpus in labor disputes; the local government in communities controlled by corporations; the work of minor courts in the handling of labor cases; and the psychology of strikes with special reference to the employment of armed guards and detectives, and the causes of violence in labor disputes. 2. Prof. George E. Barnett of Johns Hopkins University had charge of the section on labor organizations and collective bargaining. With a corps of expert assistants inquiries were made into the extent of trade unionism in this country; the organization and policies of typical unions; trade agreements, both local and sectional; purposes and methods of employers' associations; trade agreements and reasons for their success or failure; and

public agencies for arbitration and conciliation. 3. The division of unemployment was in charge of William Leiserson, who was also assistant director of the Division of Investigation and Research. Experts under his direction made investigations of casual, seasonal, and migratory labor. One of these investigators followed the harvest season from Oklahoma to North Dakota, making a study of the methods of the agricultural States in securing help during harvest time, and their effects. This led to a meeting in December, 1914, at Kansas City, of labor, immigration, and agricultural commissioners, railroad immigration officials, and police officers of western cities. This was followed by a second meeting at Omaha, February, 1915, where the National Farm Labor Exchange was organized as a medium for securing co-operation of the States in gathering and disseminating information. A study was made also of public and private employment offices in 10 Eastern and Middle-Western States. 4. Prof. John L. Coulter was in charge of the division on agricultural problems. Census material was compiled showing an increase in farm tenancy in each succeeding census; and an intensive study of farm tenancy in the Southwestern States was carried out. 5. A section on education and preparation for life under G. L. Sprague covered the subject of public and private industrial education in the United States. The administrative machinery for child labor and compulsory education laws was also investigated. 6. Various experts were employed by the section on welfare and social insurance to make inquiries into public and private welfare work. They gave special attention to the need for welfare work; the welfare methods of corporations; and the relative merits of public vs. private activity. 7. The section on safety and sanitation made an intensive study of the administration of factory laws in New York, Wisconsin, Pennsylvania, and Illinois. 8. An editorial department, directed by W. J. Lauck, was concerned with the underlying causes of industrial unrest. This department analyzed numerous statistical and other reports of the various investigations, giving special attention to wages, prices, the cost of living, and the effects of factory conditions on the physical well-being of wage earners. 9. Miss Marie L. Obenauer, chief of the Women's Division of the Bureau of Labor Statistics, directed the section on women in industry. Such questions as the following were studied: Why protective laws for women are more pronounced in the West than in the East; effect of such labor laws on interstate competition; minimum wage laws; general aspects of the employment of women. 10. The editorial division was engaged in the editing and indexing of material submitted by all investigations.

In addition to these various sections a number of independent investigations were carried on. One of these dealt with graft and other abuses in trade union organization and activities; another dealt with the Structural Iron Workers; another with the illegal entry of Asiatics; Prof. Robert F. Hoxie devoted his entire time to a study of scientific management in relation to labor problems; and Mr. W. O. Thompson studied the efficiency systems in government arsenals and shops. Various bills were prepared by the members of the staff in coopera-

tion with the Legislative Drafting Research Fund of Columbia University.

REPORTS. The various factions in the commission were not able to agree upon a unified report. The principal findings and recommendations were consequently submitted in two principal reports, one of which was sympathetic with labor and the other of which was generally approved by employers. The first of these reports was written by Basil M. Manly, Director of Research and Investigation after March, 1915, and was signed by Chairman Walsh and the three labor members of the commission. To this was added a separate report by labor representatives Lennon and O'Connell, and two supplementary statements by Commissioners Garretson and Walsh. The other principal report was written by Prof. John R. Commons and signed by himself, by Mrs. Harriman, and with certain reservations by the employer members. The employer members, Weinstock, Ballard, and Aishton, issued a separate report, and Commissioner Ballard added a supplementary statement.

Both main reports favored collective bargaining, though employer members insisted that it should be fairly conducted; and both reports favored an inheritance tax. On some minor point, also, there was some agreement as to policies, but on the whole the reports revealed a wide divergence of opinion.

The Manly Report found the following to be the main causes of industrial unrest: (1) Unjust distribution of wealth and income; (2) unemployment; (3) denial of justice in the enactment and administration of law; and (4) denial of the right and opportunity to organize. With reference to the first cause the report stated that "44 families possess aggregate incomes totaling at the least \$50,000,000 per year, while between one-fourth and one-third of male workers in factories and mines, 18 years of age and over, earn less than \$10 per week, and only about one-tenth earn more than \$20 per week"; it declared that from two-thirds to three-fourths of women workers receive less than \$8 a week, nearly one-half earning less than \$6 a week. At the other end of the social scale it found vast fortunes the ramifications of which were unknown even to their owners and which could only be squandered, hoarded or "put into so-called 'benefactions,' which for the most part constitute a menace to the State," or reinvested to secure further profits. The report condemned existing laws controlling the inheritance of property, finding in them a chief source of the development of industrial feudalism. The immense industrial principalities of the Rockefellers, Morgans, Fricks, Vanderbilts, and Astors were condemned as out of harmony with American ideals and as a menace to the welfare of the nation and the very existence of democracy. The policies advocated in this report included an inheritance tax which would limit any inheritance to \$1,000,000. The fund thus accumulated should be used to extend education, develop various social services, and extend such public work as road-building, irrigation, and reforestation. In connection with the second cause of unrest the Manly report favored various land reforms, including a prosecution of those who have obtained land or water power or mineral rights by fraud, and taxation of non-productive lands at the same rate as similar

productive lands, with exemption for all improvements. The third general cause of unrest included 12 specific charges: Difficulty of securing productive legislation; nullification by the courts of many laws that are passed; discrimination by the courts between poor and rich; perversion of the 14th amendment so as to make it protect property rights alone; lack of legal guarantee of payment of wages when due; abuse of the power of injunction; non-enforcement of labor laws; exclusion of workers from juries; injustice to innocent men during strikes; use of police; and abuses of detective agencies during strikes; the resort to martial law leading to commission of crimes with impunity by employers' agents, and severe punishment of strike leaders. With respect to these charges the report advocated the following: Constitutional guarantees to insure the protection of personal rights, including habeas corpus, jury trial, free speech, and free assembly, and to prevent courts from declaring laws unconstitutional; and laws making all qualified voters eligible to jury duty, regulating detective agencies, and guaranteeing the impartial use of militia during strikes. The fourth cause of unrest was declared by this report to be the most serious of all. It found that workers insist that the right to organize is fundamental and necessary to the preservation of their freedom. The report pointed out that the bargaining power of the employer exceeds that of the employee; and hence it condemned the open shop. While it admitted certain union abuses, it held these to be inevitable in democratic organizations. The recommendations under this heading included unlimited right to form associations for mutual betterment; prohibition of the discharge of workers for belonging to unions; the legalizing of any act by a union which would be legal for an individual; and an extension of the power of the Federal Trade Commission to include the investigation of labor relations.

The Manly report was generally recognized as particularly favorable to labor. It differed decisively from government documents in general in the vigor and feeling displayed, and in the sweeping nature of many statements insufficiently buttressed by facts. It was officially endorsed by the American Federation of Labor, the Railway Brotherhoods, and even leaders of the I. W. W. On the other hand, it was characterized as a plan of "plain ordinary robbery" by the *New York Sun*, and as "a frank project of confiscation" by the *New York Times*. From the academic point of view, it was condemned because it lacked a sufficient mass of evidence to carry conviction in multitudes of places and because of important problems almost entirely omitted. Thus it included no significant inquiry into working conditions in American industries; it neglected the question of hours of labor, and also of accident prevention, and the administration of labor laws. An even more striking omission was that although it strongly favored the organization of labor, it contained no constructive proposals for perfecting such organization.

The *Commons Report* found the chief cause of industrial unrest in the collapse of machinery for the enforcement of labor laws and the consequent distrust of government. It therefore rejected the alleged findings of the staff of investigators and the point of view repre-

sented in the Manly report. Its solution in general was based on the idea of mutual participation by employers and employees in administrative boards. One of its chief proposals is the organization of a permanent commission on industrial relations, not for investigation, but for administration. In conjunction with this commission should be organized, it thought, an advisory council including the secretaries of commerce and labor, 10 representatives of employers' and farmers' associations, 10 representatives of organized labor, and 10 persons interested in social legislation to be appointed by the commission. This advisory council would serve without pay, but would consider all recommendations of the commission before these were made public. It would therefore serve as a check upon unreasonable or biased action. This industrial commission would employ mediators to serve as conciliators in labor disputes and to serve as arbitrators or suggest arbitration if conciliation should fail. The report specified in detail principles to govern the formulation of rules and regulations by this commission, for review of matters by the commission and the courts, and the powers of the commission in securing evidence, and in the regulation of continuous (24 hours per day) industries, and of private detective agencies. The *Commons report* recommended the creation of a system of national and State employment offices, and a substantial restriction of immigration. It favored an inheritance tax graded from 1 per cent on the excess of \$25,000 fortunes left to direct heirs, to 15 per cent on fortunes over \$1,000,000 left to direct heirs; collateral inheritances would pay higher rates. This tax should be collected by the Federal government; it was estimated to produce \$200,000,000 a year, of which one-fourth would be returned to the States. By use of this fund homes for workmen, hospitals, credits for farmers, and other social betterment plans should be put into operation. Thus could be maintained sickness and unemployment insurance, also old-age pensions, employment offices, subsidies for industrial education, and aid to tenant farmers in acquiring ownership. Finally the report endorsed labor organizations and collective bargaining, and recommended the adoption of the British trades disputes act.

The Employers' Report. The supplementary report by the employers was written primarily to express their dissent from the Manly report, inasmuch as the employers had subscribed to all of the main features of the *Commons report*. The employer members declared the Manly report "to be manifestly partisan and unfair." They stated that both parties in the industrial situation are human, and therefore likely to err; hence all blame for industrial unrest could not be placed upon the employers. That these commissioners freely admitted that many employers were guilty of wrongdoing, is shown by the following quotation from their report. "There has been an abundance of testimony submitted to prove to our satisfaction that some employers have resorted to questionable methods to prevent their workers from organizing in their self-interest; that they have attempted to defeat democracy by more or less successfully controlling courts and legislatures; that some of them have exploited women and children and unorganized workers; that some

have resorted to all sorts of methods to prevent the enactment of remedial industrial legislation; that some have employed gunmen in strikes who were disreputable characters, and who assaulted innocent people and committed other crimes most reprehensible in character; that some have paid lower wages than competitive conditions warranted, worked their people long hours, and under unsanitary and dangerous conditions; that some have exploited prison labor at the expense of free labor; that some have been contract breakers with labor; that some have at times attempted, through the authorities, to suppress free speech and the right of peaceful assembly, and that some have deliberately, for selfish ends, bribed representatives of labor. All these things, we find, tend to produce industrial unrest, with all its consequent and far-reaching ills."

On the other hand, the report declared, many employers have adopted enlightened and progressive policies. Moreover, trade unions include only 16 per cent of the wage-earners of the country, and yet these are largely responsible for industrial disturbances, and are guilty of evil practices. Among such practices pointed out in this report are sympathetic strikes, jurisdictional disputes, labor-union politics, contract-breaking restriction of output, prohibition of the use of non-union made tools and materials, closed shop, contests for supremacy between rival unions, acts of violence against non-union members, and against the properties of employers, and apprenticeship rules. The report did not cite any considerable evidence regarding these condemned practices. The report did not oppose but rather favored the organization of labor, but limited labor's legitimate weapons to the strike and primary boycotts. It expressed confidence in the honesty and fairness of American labor, and the hope that employers would work with, rather than against, intelligent labor representatives.

INDUSTRIAL WORKERS OF THE WORLD. This organization was not as conspicuous in 1915 as in immediately preceding years. Its activities were local and spasmodic. It was more in evidence in and around New York than in any other section of the country, and the problem of unemployment was the cause which precipitated most of its performances. Its agitators succeeded in inducing small bodies of workers to go on strike, but in all cases other workers were found to take their places. Members of the I. W. W. occasionally resorted to spectacular actions, such as raiding restaurants, and they were charged with complicity in a plan to explode bombs in St. Patrick's Cathedral in New York City. This plot was said to be only one small part of far-reaching plans to blow up various banks and certain conspicuous capitalists such as Rockefeller, Carnegie, and others.

PATERSON. Elizabeth Gurley Flynn, an I. W. W. leader in the Paterson, N. J., strike of 1913, was acquitted in December, 1915, of the charge of inciting to riot which had been pending since the jury disagreed in her first trial, July, 1913. This was the last of the cases growing directly out of the Paterson strike to be tried. Miss Flynn was at the close of the year engaged in a contest over free speech with the Paterson authorities, and in this had the support of a large number of well known New York men and

women. On Sept. 4, Oct. 15, and Nov. 12, 1915, she was not allowed to enter the hall where a meeting was to be held; she was further ordered to leave the city. At the time of her third attempt to speak, on November 12, she was accompanied by a group of New York women who spoke in a hall while Miss Flynn was prevented from entering by the police. Miss Flynn announced her intention of continuing her attempts for free speech while the chief of police of Paterson made the statement that he would continue to prevent her unless the mayor revoked his written orders. The Paterson officials gave as their reason for doing this, the desire to escape a situation similar to the strike of 1913, in which a \$15,000,000 loss was suffered.

The acquittal of Miss Flynn by a jury outside Passaic County was made the occasion for pointing out that Patrick Quinlan was convicted by a Paterson jury on practically the same evidence as was presented against Miss Flynn. Quinlan was sentenced to from two to seven years in prison for inciting riot in Paterson during the strike of 1913. Frederick S. Boyd, who began to serve his sentence of one to seven years in New Jersey for advocating destruction of property in the Paterson strike of 1913, appealed for pardon on the ground that he was convicted because of views which he had then abandoned, regarding them as anti-social and detrimental to social welfare. He looked upon the tactics he once pursued as certain to defeat the moral and social betterment of the working class.

HILLSTROM CASE. On November 19 at Salt Lake City, Joseph Hillstrom was executed by shooting, having been convicted of the murder of J. G. Morrison, a grocer of Salt Lake City, on Jan. 10, 1914. The evidence was entirely circumstantial. Following his conviction widespread agitation in his behalf was undertaken; this was begun by the I. W. W., but soon enlisted a large proportion of the labor movement in America. The Swedish minister to the United States intervened in his behalf, and President Wilson made two appeals, the first time with success, to secure a reconsideration of the case by the Governor and the Board of Pardons of Utah, but the law was allowed to have its course.

INFANT MORTALITY. See VITAL STATISTICS.

INITIATIVE AND REFERENDUM. See ELECTORAL REFORM.

INOUE, KAORU, MARQUIS. A Japanese statesman, died September, 1915. He was born in Yamaguchi Province in 1835. As a young man he was one of the leaders in the revolt against the military dictatorship of the Tokugawa Shogun, but he was at that time strongly opposed to the intrusion of foreigners. He and his friend Ito, afterwards Prince Ito, protested against the building of a foreign legation in Tokio. In 1864, he and Ito made a secret visit to England, and this brought about a complete change in their attitude. On receiving the news that the Allied Powers were threatening to attack Shimonoseki, the headquarters of the Choshu clan, to which Inoue belonged, they returned to Japan. Here the two found themselves in such complete opposition to the mass of their fellow countrymen that a murderous attack was made on Inoue. He took a chief

part among the reformers who were spreading new ideas throughout Japan, and when these reformers had finally won the day, Inouye was rewarded with the post of vice-minister of finance in 1870, which he held under Count Okuma until 1873, when, on account of a difference of opinion with the cabinet, he resigned. In 1874 he accompanied Count Kuroda as vice-plenipotentiary to Korea in order to obtain satisfaction for an outrage upon a Japanese ship. At different times down to 1898, when he resolved to retire from public life, he was minister of home affairs, foreign affairs, finance, agriculture, and commerce. One of the most important episodes of his official life was his mission to Korea during the Japanese occupation of that country on the outbreak of the war with China in 1894. He was sent to reorganize a Korean administration after the Chinese had been driven out, and superintended the introduction of wholesale reforms. Into this work he threw himself with great ability and energy, and prepared a comprehensive programme, which he submitted to the Emperor. These reforms were, for the most part, adopted and put into effect, but their operation resulted in a large measure of failure, due chiefly to the conduct of the Japanese officials in Korea. The policy alternated between high-handed recklessness and temporary hesitancy. Popular feeling demanded greater energy in dealing with these matters, and Inouye, whose administration had been weakened by a lack of support at home, was succeeded in 1895 by General Miura, a soldier without any political or diplomatic experience. Shortly after the arrival of the latter, there occurred an outbreak in which the Queen was murdered, and the King placed under close restraint. This was followed by other disturbances, and gradually Japanese ascendancy disappeared and Russia became the dominant power in Korea. At the outbreak of the war with Russia, notwithstanding his withdrawal from public life, Inouye attended all important councils and gave advice to the minister of finance. In 1907 he was raised from the rank of Count, which had been conferred upon him in 1894, to that of Marquis. He was a statesman of vigorous intellect and of intense patriotism, and his ability of character and scholarly attainments won for him universal esteem. He was one of the last of the band of Elder Statesmen, to whom the Japanese Empire owes her rise in world politics.

INSANE, THE. See CHARITIES, *passim*.

INSANITY. It is impossible to deny the deduction from statistics collated by trained statisticians provided with ample data from which to pursue the *quesita*. The number of the insane is increasing, either simply in the gross, or in a percentage ratio. The attempt of the United States census to enumerate the mentally defective in the whole country was not repeated, because the results were admittedly faulty. Within certain State limits, as in New York, Massachusetts, and Pennsylvania, fairly accurate figures are obtainable, and trustworthy deductions may be made. The greater number released from home care and admitted into State institutions because of the increasing confidence in these institutions, has ceased to be a factor in the greater number of State patients. Greater longevity of the race, whereby a greater number of people survive to enter the third

decade of life, is still a factor, as Dana, of New York, pointed out. Foreign immigration is undoubtedly a factor of great importance, for of the certified insane in New York State, 46.7 per cent of the first admissions were of foreign birth, and 27 per cent were not citizens; just as in Pennsylvania last year the foreign-born population of Philadelphia supplied 44 per cent of the insane of that city. The insane, degenerate, and the mentally defective of foreign birth can be kept out of the country, if the government cares to appoint a sufficient number of alienists at the various ports of entry to study properly the stream of immigrants, and provides sufficient space for the segregation of doubtful cases until they can be observed under reasonable conditions for the exercise of calm judgment by the alienists. Another method of limiting the production of the insane consists of preventing the releasing on parole of many criminals; for while crime is not insanity, a vast proportion of criminals of the recidivist type are mentally abnormal, and usually have vicious habits. Hence the danger of insane offspring. But an underlying cause lies in the deviation from the old moral and mental attitude toward the healthfulness of work and its necessity for mental development, for the young, with the dangerous substitution of the doctrine of play, and only pleasurable and entertaining occupations for children of school age, as is emphasized by Burr, of Philadelphia. To this false method may be added, as another grave error, the coddling of old offenders in prisons, instilling into their minds the idea that they are victims of society, and should be commiserated therefor. Duty and self-control must be preserved if a mentally sturdy population is to be built up.

Heron, in *Biometrika*, showed the fallacy of Mott's fanciful "law of anticipation," in the insane. By this so-called law Mott, of London, predicated that the offspring of insane parents became insane, if at all, at an earlier age than their parents, and thus the tendency was to abolishing an unfit stock. Heron's study of the method by which Mott's data were compiled shows the possibility of such a law is disproved by mathematical evidence, and therefore it cannot be accepted. This effectually disposes of Mott's dangerous advice to the offspring of insane parents to marry, if at 25 years they are mentally sound.

The seventh annual meeting of the National Committee for Mental Hygiene was held Feb. 15, 1915. Gifts of \$40,000 by Mrs. Elizabeth Milbank Anderson, and \$44,500 by Mrs. W. K. Vanderbilt were announced, and the contribution of the services of Dr. T. W. Salmon for a number of years by the Rockefeller Foundation was also recorded. Seven States have such organizations as this, and preparations are being made to found them in 20 more States. A quarterly magazine devoted to articles on mental hygiene, the prevention of insanity, the care and treatment of the insane, the feeble-minded, and alcohol and drug addictions will be published. The president is Dr. L. F. Barker, Baltimore; the medical director is Dr. T. W. Salmon; the secretary is Clifford W. Beers, 50 Union Square, New York City.

In the 1914 YEAR BOOK, under the caption ALCOHOL, extended reference was made to the partial or complete prohibition of the liquor

formerly served to soldiers by many governments now engaged in the great European war. Gerver, in the *Russkiy Vrach*, reports on the results, as far as the production of alcoholic psychoses is concerned. He describes the usual war psychoses, including those caused solely by environment and emotional strain, and those which were prematurely developed by war in the predisposed, and claims that the total in the present campaign is only about 1 per 1000, against 2 or 3 per 1000, the main cause being the total absence of alcoholism. In the Russo-Japanese War alcoholism was responsible for one-third of all the psychoses. In the present campaign there has not, he reports, been a single case of alcoholic insanity.

May, of the New York State Hospital Commission, reports that on Sept. 30, 1915, the number of committed insane and voluntary cases in State hospitals together with committed insane in licensed private retreats was 17,382 men and 19,280 women, making a total of 36,662 patients (an increase of 938 over last year); of which number 1351 were inmates of Dannemora and Matteawan, the criminal institutions, and 1003 were in private licensed retreats. There were 1175 on parole from civil hospitals. The net increase in the civil hospitals for the year was 951, against 758 for 1914, and 975 for two years ago. During the year 794 were returned to other States or deported to foreign countries, against 1224 the previous year. The total number admitted to civil hospitals during the year was 7934, of which number 6204 were first admissions, and 1730 were readmissions. From the 14 civil hospitals 1576 were discharged as recovered, 1795 as improved, and 3036 died during the twelvemonth. The amount disbursed for maintenance was \$6,865,385.98. Upon new buildings, extraordinary repairs or equipment, or emergencies, was expended the sum of \$734,699. The annual per capita for maintenance (omitting calculation of the cost of lodging), was \$210.89 against \$208.81 last year. The ratio of the insane was 1 to 277 of the population of the State, enumerated in 1915 as 9,687,744, including 1,028,229 aliens. The chief contributing cause, next to heredity, is alcohol, and syphilis was the determining cause in a large percentage of cases. These two preventable causes were in 1914 the precipitating factors in 26 per cent of the cases. Figures for 1915 on this subject are not yet available. Of the first admissions in 1914, 46.7 per cent were of foreign birth, and 64.6 of foreign parentage.

The usual reports from the commissioners in lunacy for England and Wales, and of the inspector of lunatics in Ireland were not available this year.

INSANITY ON FARMS. See AGRICULTURE.

INSECTS. See ZOOLOGY.

INSECTS, PROPAGATION OF DISEASE BY. Wheeler, in an article on ants and bees as carriers of pathogenic organisms in the *American Journal of Tropical Diseases*, marvels at the amount of investigation and study that has been necessary to establish the relationship of insects to malaria, yellow fever, bubonic plague, and other human scourges. To the trained entomologist who sees insects and observes their habits, the wonder is that the connection has not sooner been established. The cockroach, for example, may disseminate disease in a number of ways. It will devour any sufficiently soft

substances, from human food to the faeces of other cockroaches, and in its intestinal canal such organisms as the diphtheria bacillus, pneumococcus, and meningococcus are harbored and thence easily disseminated. The cockroach lives by preference in filthy cracks and crevices, and it carries about with it mechanically a host of germs; thus, a given sample of food to which cockroaches have access can hardly escape contamination by a variety of virulent organisms. Ants, which often swarm in houses, particularly in the tropics, have not escaped suspicion. They live on liquid food only. When semi-solid and minute particles are taken in, the fluid is pressed out of them and the residual dry pellet subsequently ejected from the subpharyngeal pocket. Wheeler points out that these insects may therefore contaminate food in three different ways: By walking over it, by dropping into it infected hypopharyngeal pellets, and through germ-laden faeces. In respect to bees, Wheeler has observed the stingless bees of the genus *Trigona* visit garbage heaps and human excreta, presumably gathering material which they manufacture into wax cells for storing honey, which honey is eagerly sought by the natives in many parts of tropical America. According to Wheeler intestinal disorders, or even death, have followed the eating of such honey.

The activity of the house fly in spreading diarrhoeal diseases among children has been noted in previous numbers of the YEAR BOOK. A report of a two years' investigation under the joint direction of the Bureau of Public Health and Hygiene of the New York Association for Improving the Condition of the Poor, and the Department of Health of New York City, has recently been published. The object of the inquiry was to determine the status of the house fly in relation to the incidence of infant diarrhoea. The conclusion, as summarized in the report, indicates that twice as many cases of diarrhoea occur among infants who are exposed to flies as occur among those who are protected from them. Infants in dirty homes are almost twice as likely to contract diarrhoea as those living in cleaner surroundings. The malign effects of dirt and flies combined are about equal to those of artificial feeding. Artificial feeding and dirt combined offer a still more serious handicap to the infants. Breast-feeding is therefore of the utmost importance among infants living in dirty surroundings. The ideal condition for reducing infant mortality is breast-feeding in clean, fly-protected homes. During this investigation cases were divided into groups, fly-protected and fly-exposed, but living under similar sanitary conditions. Nurses visited the homes every five days. The fly-exposed or non-protected group received the usual instructions in child hygiene, but no special emphasis was laid on eliminating the house fly. In the protected group great emphasis was placed on the protection of the baby from contact with flies, and the constant use of netting was insisted on in the case of infants in the cradle, bed, or go-cart. See also ENTOMOLOGY; MALARIA; PLAGUE; and ROCKY MOUNTAIN SPOTTED FEVER.

INSOMNIA. See PSYCHOLOGY, *Dream and Sleep*.

INSTITUTE OF FRANCE. See ACADEMY, FRENCH.

INSURANCE. LIFE INSURANCE. Notable features of life insurance history for 1915 were

the completion of the mutualization of the Metropolitan Company and Prudential Company, the continuance of the movement among fraternal associations to place their business on a sound actuarial basis, and continued agitation by insurance companies and others against excessive taxation.

The Metropolitan Life Insurance Company of New York with 14,500,000 policy holders and more than \$1,000,000,000 of insurance in force had begun steps toward mutualization late in 1914. On December 28th a meeting of the policy holders had authorized the purchase of the 80,000 shares of capital stock worth \$2,000,000 at par for \$6,000,000. An examination by the New York Insurance Department completed early in January showed that the surplus of the Company over all liabilities exclusive of the sum necessary to purchase the outstanding stock was \$29,294,000. While more than 90 per cent of the policies then written were non-participating, it was understood that the mutualization conferred upon these policies the right to participate in the savings of the company. Moreover all policies thereafter written would be upon the mutual or participating basis.

The Prudential Insurance Company of Newark, N. J., entered upon the final stages of its mutualization plan in January, when a New Jersey court authorized the company to purchase the outstanding 40,000 shares of its capital at \$455 a share. While this was believed to be an excellent price for the stock it was pointed out that by this transfer the stockholders surrendered control of hundreds of millions of assets and that moreover the stock was paid for by the company itself out of funds to which the stockholders had more legal claims than the policy holders. The mutualization of these two great companies which dominate the industrial field and are important factors in other phases of life insurance was a striking indication of the tendency to force all insurance to a basis of mutual cooperation and social responsibility.

In this connection may be noted the transfer of 502 of the 1000 shares of the Equitable Life Assurance Society from the Morgan estate to Gen. T. Coleman du Pont. This was the third transfer of recent years. It was sold by James H. Hyde to Thomas F. Ryan and by him to Mr. Morgan. It was announced that the new purchaser would gladly cooperate in carrying through some scheme of mutualization.

Statistics. According to the report of the New York Superintendent of Insurance the total assets of the 37 companies doing a life insurance business in that State were \$4,597,000,000 on Dec. 31, 1914. Of this vast sum about 55 per cent was credited to 12 New York State companies, and the remainder to companies of other States or of other countries. The total assets included \$1,521,000 in mortgage loans, \$2,013,000,000 of stocks and bonds, \$657,168,000 of loans on policies, and \$151,213,000 of real estate. The capital and surplus of these companies amounted to \$157,870,000. Other items of liabilities were reserve funds of \$3,948,474,000, and dividends due or set apart on deferred dividend policies of \$397,374,000. The total income of these 37 companies was \$874,792,000, of which one-half went to the New York State companies. This income included \$654,174,000 from premiums and \$197,612,000 from interest. The total disbursements were \$644,399,000, of which \$204,125,000 were

for death claims, \$58,944,000 on endowments, \$7,426,000 on annuities, \$102,510,000 for lapsed, surrendered, and purchased policies, \$104,128,000 in dividends to policy holders, \$55,294,000 for commissions, and \$56,217,000 for salaries and medical fees. The total insurance in force in all companies on December 31, 1914, was \$18,798,830,000. The amount issued during 1914 was \$2,368,388,000. It was estimated that the above companies represented fully 90 per cent of life insurance assets and business of the entire country.

SAVINGS BANK INSURANCE. Following the Armstrong investigations of 1905-06 much interest was aroused in various proposals for supplying cheaper insurance, especially to persons of small means. The only State that undertook a practical reform in this field was Massachusetts, which authorized savings banks to issue policies not exceeding \$500. This maximum was raised in 1915 to \$1000. One savings bank established the plan in its organization in 1908; another followed in 1909; still another in 1911; and since 1912 four banks have issued such insurance. In 1915 they reported 10,217 policies with aggregate insurance of \$4,063,787. Actuarial comparisons showed that their rates averaged about 25 per cent less than those of regular industrial insurance companies. Their average policy is about \$400, while the average of industrial companies is estimated at less than \$150. The dividends which they have declared are remarkably large, ranging in the last two years for the oldest bank from $8\frac{1}{2}$ per cent on one-year policies to 25 per cent on seven-year policies. Moreover this bank in 1915 paid extra dividends ranging from 25 per cent of the regular dividend on one-year policies to 25 per cent on the regular dividend on seven-year policies.

FIRE INSURANCE. The *Journal of Commerce* estimated the fire loss in the United States and Canada in 1914 at \$235,591,000 or \$11,000,000 more than in 1913; and the *Insurance Press* placed the loss of 1915 at \$172,700,000. The loss of 1914 was the greatest in any year except 1908, the year of the Chelsea fire; 1906, when San Francisco burned; and 1904, when the Baltimore fire occurred. The average annual loss for six years, 1909-14 during which no great fire occurred, was \$226,332,000. It was estimated that three-fourths of this loss was preventable. The largest loss of the year in a single fire was at Newport News, Va., where in August \$2,000,000 in property and several lives were destroyed. The 1915 Report of the New York Insurance Department summarized the business of 241 fire and fire-marine companies and 23 marine companies doing business in that State. They showed fire risks in force Dec. 31, 1914, of \$60,200,000,000 and marine risks in force of \$1,387,000,000. During the year these companies had assumed fire risks of \$51,728,000,000 on which they had charged premiums of \$527,675,000; and they had assumed marine risks of \$16,687,000,000 for which they charged premiums amounting to \$70,962,000. The gross income of all of these 264 companies for the year was \$425,983,000, of which \$375,878,000 was from premiums. Losses paid aggregated \$210,298,000; dividends, \$28,585,000. Nevertheless in spite of this enormous business most of the companies showed a loss from underwriting, and in the aggregate the loss from underwriting amounted to \$549,193. This was offset, however, by gain from invest-

ments amounting to \$31,147,000. When from this, however, was deducted the dividends declared there was a net gain in the surplus of all companies of only \$519,152. This, however, contrasted with a net loss in 1913 of \$10,041,000. These figures show that fire insurance rates are in general scarcely sufficient to cover losses, expenses, and increased policy reserve liabilities.

The foregoing statistics do not include a summary of the town and county cooperative fire insurance corporations of New York State. On Dec. 31, 1914, these included 35 advance premium companies with \$155,799,000 insurance in force; 70 town assessment companies with \$58,129,000 insurance in force; and 64 county assessment companies with \$312,193,000 in force.

STRIKE INSURANCE. See section so entitled under **STRIKES**.

CASUALTY, CREDIT, FIDELITY, ASSURETY INSURANCE COMPANIES. Exclusive of mutual employers' liability and workmen's compensation corporation these companies doing business in New York State showed total assets on Dec. 31, 1914, of \$185,925,000. They had \$44,148,000 capital, \$31,673,000 net surplus and other liabilities of \$110,104,000. Their total income for the year was \$148,974,000, of which \$137,708,000 was from premiums. Their total disbursements were \$133,693,000, of which \$55,702,000 was for losses paid, \$31,214,000 for commissions and \$19,416,000 for salaries and fees.

FRATERNAL INSURANCE. The 74 fraternal orders reporting to the New York Commissioner of Insurance showed a total insurance in force Dec. 31, 1914, of \$6,381,000,000. They reported assets of \$147,766,000; liabilities of \$21,447,000; income for the year of \$87,312,000; and disbursements of \$74,140,000. Some of the largest organizations in the foregoing summary with their membership at a recent date, their income during 1914 and insurance in force Dec. 31, 1914, were the following: Tribe of Ben Hur, 105,943, \$1,615,000, \$111,394,000; Independent Order of Brith Abraham, 40,083, \$875,000, \$97,245,000; Brith Abraham, 200,760, \$527,000, \$35,821,000; Brotherhood of American Yeomen, 120,000, \$2,475,000, \$257,500,000; Catholic Mutual Benefit Association, 63,700; \$1,520,000, \$83,236,000; Independent Order of Foresters, 218,074, \$6,292,000, \$196,412,000; French Canadian Artisans' Society, ———, \$939,000, \$31,597,000; Improved Order of Heptasophs, 70,110, \$1,536,000, \$90,345,000; Knights of Columbus, 327,750, \$1,750,000, \$113,427,000; Knights of Honor, 16,000, \$1,202,000, \$23,019,000; Knights and Ladies of Honor, 67,500, \$1,561,000, \$62,728,000; Endowment Rank of the Knights of Pythias, 71,000, \$2,805,000, \$98,686,000; Ladies' Catholic Benevolent Association, 147,025, \$1,566,000, \$120,065,000; Ladies of the Maccabees of the World, 171,618, \$2,305,000, \$123,271,000; Maccabees, 331,700, \$6,070,000, \$385,926,000; Modern Woodmen of America, 908,319, \$14,104,000, \$1,477,584,000; National Protective Legion, ———, \$403,000, \$14,312,000; National Union, 62,483, \$2,773,000, \$113,761,000; Order of United Commercial Travelers of America, 74,000, \$781,000, \$364,820,000; Polish National Alliance of United States of North America, ———, \$1,161,000, \$58,878,000; Protected Home Circle, 87,376, \$1,053,000, \$76,873,000; Royal Arcanum, 248,490, \$9,267,000, \$476,413,000; Royal Neighbors of America, ———, \$2,196,000, \$269,235,000; Travelers' Protective Association of America, ———, \$542,000,

\$244,490,000; Woodmen Circle, Supreme Forest, ———, \$1,837,000, \$141,636,000; Woodmen of the World, Sovereign Camp, 732,000, \$11,865,000, \$970,130,000.

The total membership of the more than 300 fraternal bodies in the United States is estimated at approximately 18,000,000. The membership of the largest of these organizations not mentioned above was at a recent date as follows: Freemasons, 1,760,277; Odd Fellows, 1,622,100; Modern Woodmen of America, 921,899; Knights of Pythias, 729,053; Independent Order of Rechabites, 701,040; Order of Eastern Star, 800,000; International Order of Good Templars, 620,000; Loyal Order of Moose, 620,000; Improved Order of Red Men, 479,033; Benevolent and Protective Order of Elks, 442,658; Order of Eagles, 400,000; Royal Arch Masons, 422,359; Ancient Order of United Workmen, 350,000; Knights of Columbus, 346,560; Order of Owls, 346,745; Ancient Order of Hibernians, 250,000; Knights Templar, 237,368; Foresters of America, 205,756; Independent Order of Foresters, 218,074; Junior Order of United American Mechanics, 230,000; Nobles of the Mystic Shrine, 220,000; Brotherhood of American Yeomen, 196,478; Woman's Benefit Association of the Maccabees, 179,716; Loyal Orange Institution, 150,000; Knights and Ladies of Security, 155,399; Ladies' Catholic Benevolent Association, 155,080; and Tribe of Ben Hur, 101,011.

INSURANCE, WORKMEN'S. See **WORKMEN'S COMPENSATION**.

INTEMPERANCE. See **ALCOHOL**.

INTERNAL COMBUSTION ENGINES.

With the war in Europe, where the most advanced practice in internal combustion engines has been carried on, there was little to note in the way of progress. The largest single tandem gas blowing engine to be built in the United States was constructed by the Mesta Machine Company for the Pennsylvania Steel Company's plant at Steelton, Pa., and had gas cylinders 46 inches in diameter, air cylinders 84 inches, and a stroke of 60 inches. The speed was to range from 45 to 85 revolutions per minute. A few other large gas blowing engines were built during the year, but the construction was rather in the way of medium and small units, especially for the natural gas sections and for small isolated plants, as at pumping stations. There was manifested in the United States a slight increase in the use of the stationary Diesel engine in sizes under 500 horse power, with a predominance of four-stroke cycle type, while there was an increase in the use of the medium compression type of gas engine. The effects of the war were also felt in the use of Diesel engines for marine work, and only a few ships were reported as so fitted during the year. *Lloyd's* reported a total of 38 vessels with this type of machinery. The largest Diesel engine so far constructed in the United States was one of 2500 horse power and six cylinders for the fuel ship *Maumee*, built by the United States government. Of course the widest use of the internal combustion engine was in motor vehicles where further progress was being made to secure increased lightness and economy. These are discussed under **AUTOMOBILES**.

INTERNATIONAL ASSOCIATION OF INDUSTRIAL ACCIDENT BOARDS AND COMMISSIONS. See **WORKMEN'S COMPENSATION**.

INTERNATIONAL CORPORATION, AMER-

ICAN. See FINANCIAL REVIEW, section so entitled.

INTERNATIONAL ENGINEERING CONGRESS. A successful international engineering congress was held at San Francisco in connection with the Panama-Pacific Exposition, Sept. 20-25, 1915, and was largely attended, 850 members registering, though naturally the number of foreign representatives was much less than would have been the case were conditions in Europe normal. A series of important papers were presented and discussed, and the record of the proceedings formed a substantial contribution to modern engineering literature, giving as they did a thorough discussion of the most improved and most modern works. These topics were grouped under a number of general heads with a somewhat minute subdivision, papers being arranged to cover as many aspects of the subject as would prove of general professional interest. These included the following topics: The Panama Canal, with papers by General Goethals and other members of the engineering staff; waterways, both harbor and river improvement; irrigation, with a discussion of irrigation in foreign countries; municipal engineering; railway engineering, including an extraordinarily broad range of papers dealing with all departments of railway engineering and operation, electric operation, and especially tunnel construction; mechanical engineering; engineering and technical education; electrical engineering; mining engineering; metallurgy; naval architecture; and marine engineering. Prof. W. F. Durand, professor of mechanical engineering at Stanford University, California, was chairman of the Committee of Management, and W. A. Cattell was the secretary-treasurer. Major-Gen. George W. Goethals was the presiding officer, and A. M. Hunt was the chairman of the Committee on Papers.

INTERNATIONAL INSTITUTE OF AGRICULTURE. See AGRICULTURE.

INTERNATIONAL LANGUAGE. Many had thought that the very idea of an international language must be given up after this war. Facts tell another story. Thanks to their already strong organization, the supporters of Esperanto have rendered great services since August, 1914. They have established in Geneva, in connection with the office for exchange of prisoners, an international Esperanto office, the aim of which is to forward private correspondence between the various countries engaged in the war. They claim that they handle an average of 10,000 letters a month. The Red Cross has availed itself of Esperanto; they had a little guide printed for the ambulance service, containing the most indispensable sentences in about 20 languages, and with a translation in Esperanto which serves as the common medium. One can easily understand the services rendered by such a scheme in some eastern countries especially. We are told that the general staffs in the various armies find Esperanto very valuable, but we have not been able to obtain actual facts on this point.

In Germany, where Esperanto has in recent years gained much ground—especially in self-defense against the so-called Chevalier plan (see below)—they made use of it considerably for propaganda purposes. They send to the neutral countries of Europe the translation of the "Official Reports" of the German government on the

progress of the war: *Europa milito, Germanaj oficialaj raportoj esperantigitaj*. Besides, they spread a pamphlet all over Europe, *La Vero pri la milito* (Truth about the War).

An interesting collection of letters from prisoners and wounded telling how Esperanto had helped in the most desperate situations, will be found in the periodical *Germana Esperantisto*, published in Dresden. Courses in Esperanto have been organized in various concentration camps.

New efforts have been made by Rev. E. P. Foster to bring before the public his universal language RO, launched two years ago, and which does not compare unfavorably with other projects for an international language. He publishes a little monthly called *World Speech*, in Marietta, Ohio.

In his small book *Le Français et l'Anglais, langues internationales*, A. Dauzat brings before the public once more the idea of Chevalier, launched as early as 1892, and approved by such men as Richet, H. G. Wells (in *Anticipations*), and Michel Bréal, the linguist; it had been submitted for consideration in 1910 to the International Congress of living languages. It suggests an agreement between France, England, and the United States of America, to the effect that English be rendered obligatory in French schools, and vice versa French in England and America. This would mean that 180,000,000 people would speak one common language besides their native language, not counting 400,000,000 more in the French and English colonies. Thus, these two languages would be the international languages. The objection made by Diels, the rector of the University of Berlin, at the time of the first discussion, namely, that the plan leaves Germany out of the agreement, would to-day be another argument in its favor in the eyes of the promoters.

INTERNATIONAL PANAMA-CALIFORNIA EXPOSITION. See EXPOSITIONS.

INTERNATIONAL PANAMA-PACIFIC EXPOSITION. See EXPOSITIONS.

INTERNATIONAL PEACE AND ARBITRATION. Since the list of Bryan-Wilson treaties published in the YEAR BOOK for 1914 (page 368), the following additional information has been gathered by the World Peace Foundation:

Bolivia. Order of acceptance in principle, 11; seventh treaty signed at Washington, Jan. 22, 1914; ratification advised by United States Senate Aug. 13, 1914; ratified by the President Jan. 4, 1915; ratified by Bolivia Nov. 14, 1914; ratifications exchanged at Washington Jan. 8, 1915; proclaimed and in force for five years from Jan. 9, 1915; text, Treaty Series, No. 606.

Costa Rica. Order of acceptance in principle, 24; twelfth treaty signed at Washington Feb. 13, 1914; ratification advised by United States Senate Aug. 13, 1914; ratified by the President Nov. 11, 1914; ratified by Costa Rica July 25, 1914; ratifications exchanged at Washington Nov. 12, 1914; proclaimed and in effect for five years, Nov. 13, 1914; text, Treaty Series, No. 603.

Denmark. Order of acceptance in principle, 21; tenth treaty signed at Washington Feb. 5, 1914; ratified by Danish House Feb. 27, 1914; rejected by Danish Senate March 28, 1914; redrafted and signed at Washington April 17, 1914; ratifications advised by United States Sen-

ate Sept. 30, 1914; ratified by President Jan. 14, 1915; ratified by Denmark Nov. 21, 1914; ratifications exchanged at Washington Jan. 19, 1915; proclaimed and in effect for five years, Jan. 20, 1915; text, Treaty Series, No. 608.

France. Order of acceptance in principle, 3; twenty-third treaty signed at Washington Sept. 15, 1914; ratification advised by United States Senate Sept. 25, 1914; ratified by the President Jan. 14, 1915; ratified by France Dec. 3, 1914; ratifications exchanged at Washington Jan. 22, 1915; proclaimed and in effect Jan. 23, 1915; text, Treaty Series, No. 609.

Great Britain. Order of acceptance in principle, 2; twenty-fourth treaty signed at Washington Sept. 15, 1914; ratification advised by United States Senate Sept. 25, 1914; ratified by the President Nov. 14, 1914; ratified by Great Britain Oct. 8, 1914; ratifications exchanged at Washington Nov. 10, 1914; proclaimed and effective for five years Nov. 11, 1914; text, Treaty Series, No. 602.

Guatemala. Order of acceptance in principle, 16; second treaty signed at Washington Sept. 30, 1913; ratification advised by the Senate, with amendments, Aug. 13, 1914; ratified by the President Aug. 27, 1914; ratified by Guatemala May 15, 1914; ratifications exchanged at Washington Oct. 13, 1914; proclaimed and in effect for five years Oct. 13, 1914; text, Treaty Series, No. 598.

Norway. Order of acceptance in principle, 6; sixteenth treaty signed at Washington June 24, 1914; ratification advised by United States Senate Aug. 13, 1914; ratified by the President Oct. 14, 1914; ratified by Norway Sept. 18, 1914; ratifications exchanged at Washington Oct. 21, 1914; proclaimed by President Oct. 22, 1914; text, Treaty Series, No. 599.

Portugal. Order of acceptance in principle, 19; eighth treaty signed at Lisbon Feb. 4, 1914; ratification advised by United States Senate Aug. 13, 1914; ratified by the President Oct. 21, 1914; ratified by Portugal Sept. 26, 1914; ratifications exchanged at Washington Oct. 24, 1914; proclaimed by President Oct. 27, 1914; text, Treaty Series, No. 600.

Spain. Order of acceptance in principle, 18; twenty-fifth treaty signed at Washington Sept. 15, 1914; ratification advised by United States Senate Sept. 25, 1914; approved by Spanish Council of Ministers Oct. 15, 1914; signed at Washington Sept. 15, 1914; ratification advised by the Senate Sept. 25, 1914; ratified by the President Nov. 23, 1914; ratified by Spain Nov. 23, 1914; ratifications exchanged at Washington Dec. 21, 1914; proclaimed and in force for five years from Dec. 23, 1914; text, Treaty Series, No. 605.

Sweden. Order of acceptance in principle, 5; twenty-eighth treaty signed at Washington Oct. 13, 1914; ratification advised by the Senate Oct. 22, 1914; ratified by the President Jan. 4, 1915; ratified by Sweden Nov. 13, 1914; ratifications exchanged at Washington Jan. 11, 1915; in effect for five years from date of exchange; proclaimed Jan. 12, 1915; text, Treaty Series, No. 607.

The following is a list of countries with which the Bryan-Wilson treaties have been negotiated, in the order of their negotiation:

Salvador August 7, 1918
Guatemala September 20, 1918

Panama	September 20, 1913
Honduras	November 3, 1913
Nicaragua	December 17, 1913
Netherlands	December 18, 1913
Bolivia	January 22, 1914
Persia	February 4, 1914
Portugal	February 4, 1914
Costa Rica	February 13, 1914
Switzerland	February 13, 1914
Dominican Republic	February 17, 1914
Venezuela	March 21, 1914
Denmark	April 17, 1914
Italy	May 5, 1914
Norway	June 24, 1914
Peru	July 14, 1914
Uruguay	July 20, 1914
Argentina	July 24, 1914
Brazil	July 24, 1914
Chile	July 24, 1914
Paraguay	August 29, 1914
China	September 15, 1914
France	September 15, 1914
Great Britain	September 15, 1914
Spain	September 15, 1914
Russia	October 1, September 18, 1914
Ecuador	October 13, 1914
Greece	October 13, 1914
Sweden	October 13, 1914
Norway	January 7-12, 1915

In a number of instances as will be seen by references to the above list and that published in the YEAR BOOK for 1914, the treaties were not consummated by the signatory powers after their negotiation.

Arbitrations were in abeyance during the European war. On the other hand problems for arbitration were being made by war, which was drawing vivid attention to the value of pacific settlement. In the future, it was thought, this must result in a very great development of arbitration as a means of settling international disputes and in the normalization of their use. Moreover, wherever possible, the system of pacific settlement continued normally throughout the war period.

The European war began with two cases pending before The Hague Court. Three were pending in 1915. The cases settled upon before the war were France, Great Britain, and Spain *versus* Portugal relative to religious properties in Portugal expropriated by the republic; and France *versus* Peru involving the claims of French creditors against a Peruvian bond issue. The case arising since the outbreak of the war was that of the interpretation of Prussian-American treaties arising out of the indemnity claims for the loss of the *William P. Frye*. The cases of uncertain result because of the war were those between Serbia and Turkey relative to properties of the Ottoman state in ceded territories; and Italy *versus* Austria-Hungary relative to damage done by mines in the Adriatic Sea in October, 1914. Outside of The Hague circle the British-American Claims Commission sitting at Washington was technically in session.

A protocol between the United States and Panama for reference to arbitration of indemnity due to a riot in Panama on July 4, 1912, was signed at Panama on Nov. 27, 1915. This action falls under the so-called Pan-American convention for the arbitration of pecuniary claims signed at Buenos Aires, Aug. 11, 1910, and ratified by the United States, May 1, 1911, being proclaimed by the latter, July 29, 1914. Undoubtedly there were occurring throughout the world various other instances requiring arbitration, but according to the World Peace Foundation the overshadowing influence of the war so thoroughly commanded the space of the publica-

tions to which one normally looked for reports of such plans that they did not come to the attention of those interested.

The war both during its course and in its final result involved a veritable hotbed of arbitration cases. The Balkan Wars produced ten cases of individual arbitration and two cases of general reference to the same method. The *Frye* case, already decided upon, was an illustration of the process involved.

As to the normal operation of the system of arbitration the United States after Aug. 21, 1914, brought into force agreements extending arbitration conventions with Salvador, August 21; with Portugal October 27; with Costa Rica November 13; and with the Netherlands Aug. 21, 1915. The only new general arbitration treaty signed was an agreement between the United Kingdom and Portugal signed at London, Nov. 16, 1914. Belligerents regularly renewed engagements expiring during the year, with neutrals.

The Carnegie Foundation published a pamphlet giving in detail the signatures, ratifications, adhesions, and reservations to the conventions and declarations of the first and second Hague Conferences. It also published a pamphlet containing a list of arbitrations and diplomatic settlements of the United States.

A striking feature of the war was the recognition by the old-world governments of the force of public opinion. The issuance of the varied colored books by the European nations to explain and justify their entrance and participation in the war was an appeal to the public opinion of the world for its moral support. This seemed a most encouraging symptom to those who relied upon the force of public opinion as the sanction of international law and treaties.

An interesting development of the European war was the various efforts of sundry organizations and individuals not only to end the war, but to prevent future wars. *The Survey* (New York) summarized the programmes of ten of these movements. That of The League to Enforce Peace, American Branch, urged that all justiciable questions be submitted to a judicial tribunal for hearing and judgment, both upon the merits and upon any issue as to its jurisdiction of the question; all other questions to be submitted to a council of conciliation for hearing, consideration, and recommendation; signatory powers to use jointly "forthwith both their economic and military forces against any one of their number that goes to war" before issue is submitted to one of the tribunals; further formulation of international law by conferences between signatory powers; such formulations automatically to become law "unless some signatory shall signify its dissent within a stated period."

The Central Organization for a Durable Peace (with headquarters at The Hague) declared that states should agree to submit all disputes to peaceful settlement. There should be created (a) a permanent court of international justice; (b) a permanent council of investigation and conciliation. States should bind themselves to take concerted action, diplomatic, economic, or military, against a state using military force instead of submitting disputes to judicial decision or to the mediation of the council. The Hague Conference should be given a permanent organization and should meet at regular intervals. Other recommendations were: No annexation or trans-

fer of territory contrary to interests and wishes of population concerned; and where possible a plebiscite; parliamentary control of foreign policy; secret treaties to be void; equality before law; religious liberty and free use of native language guaranteed to all nationalities; international reduction of armaments; freedom of seas; right of capture at sea to be abolished; equal treatment of commerce for all nations anywhere.

The English Fabian Plan involved an international high court for the decision of justiciable issues (one member from each of eight great Powers; seven from all the lesser Powers); international council for deliberation and legislation (five members from each great Power; two from each lesser); the court to order execution of any or all of twelve economic sanctions and if these are resisted by military or naval force, the other nations to make common cause (with military and naval forces) against the offender; an international council to legislate, subject to ratification by the states (three-fourths vote to carry in legislation not affecting independent sovereignty or territorial integrity and not requiring any change in internal laws).

The National Peace Council (representing the Federation of British Peace Societies) declared against territorial change without consent of the population involved, and recommended: Foreign policy and treaties subject to parliamentary control; armament question to be put before a congress of nations; a congress to remove obstacles to freedom of trade; a peace commission to extend its functions to include both those of a commission of inquiry and of a permanent Hague court of arbitration; the establishment of an international peace commission such as those already established between the United States and certain other Powers; the formation of a permanent Congress of Nations composed of delegates appointed by the parliaments, to settle important international affairs which might give rise to war; further elaboration by the Congress of The Hague Convention regulating the conduct and methods of warfare.

The French General Confederation of Labor demanded compulsory arbitration; a federation of nations; the right of all peoples to dispose of themselves to be safeguarded; independence of nationalities; suppression of secret diplomacy; end of competitive armament; conference of organized labor forces of the world at same time and place as conference of diplomats.

German-Austro-Hungarian Socialists demanded development of international arbitration courts; compulsory arbitration; recognition of the right of every people to determine its own destiny; all treaties to be under democratic parliamentary control; international agreement to limit armament with general disarmament as the ultimate goal.

The Swiss Committee for the Study of the Foundations of a Durable Peace adopted the following programme: International organization; arbitration; commission of inquiry; development of international law; no annexation without consent of people involved; reciprocal guarantee of territorial integrity; no secret treaties; direct participation of parliaments in foreign affairs; limitation of armaments by voluntary agreement; nationalization of manufacture of munitions; participation of neutrals in the negotiations for peace; open door in colonies.

The secretary of the Union of International

Associations (at Brussels) announced this programme: Court of arbitration and court of justice; council of inquiry and conciliation; council of states, taking in concert diplomatic, economic, and military measures; international armed force consisting of national contingents under an international general staff; international parliament with two houses—the lower composed of delegates from the various parliaments, and the upper of delegates from the international associations representing the fundamental social forces; no annexation and no right of conquest; guarantee of rights of minorities; freedom of nationalities; democratic control of foreign policy; suppression of alliances and of secret treaties; considerable reduction of armies and application of war budgets to education, etc.; freedom of commerce, at least in colonies; woman suffrage; reform of education and of the press.

The International Congress of Women which met at The Hague (April 30–May 1), and over which Jane Addams presided, declared for a permanent international court of justice to settle all justiciable questions; a permanent council of investigation and conciliation; social, moral, and economic pressure of all nations upon any country which resorts to force instead of referring its case to arbitration or conciliation; convocation of Third Hague Conference; formulation of principles of justice, equity, and good will by a permanent international conference with regular meetings, women participating; no transfer of territory without consent of both male and female inhabitants; democratic control of foreign policy; secret treaties void; treaties to be ratified by parliament; nationalization of the manufacture of arms and munitions; ultimate disarmament; continuous conference of neutral nations to offer mediation and proposals of peace; freedom of the seas and of the great maritime highways; equal suffrage for men and women; investments in foreign countries to be made only at investor's risk; education of children for peace.

The platform of the *Der Bund Neues Vaterland* (Germany) involved the development of international organization; "real guarantees"; further development of international law by future Hague conferences; no annexation; no secret treaties; open door; freedom of the seas.

The proposals of the Henry Ford Peace Party, which was generally treated by the American press as a fantastic enterprise, had not been formulated in 1915.

A great number of proposals were put forward by individuals which show not only the widespread and deep-seated interest in the questions, but a vast amount of study and consideration. Among those putting forth such plans were Roger W. Babson, George W. Perkins, W. O. Hart, Harrison Gray Otis, of Los Angeles, and Dr. Charles W. Eliot, whose book *The Road Toward Peace* was one of the notable contributions to the discussion.

Another interesting proposition put forward is that of "The Union of Democratic Control" that was organized in Great Britain. Its object was to secure for the present and for the generations that follow, a new course of policy which will prevent a similar catastrophe to this present war ever again befalling the empire. The four cardinal points in the union's policy were as follows:

1. No province shall be transferred from one government to another without the consent, by plebiscite or otherwise, of the population of such province.

2. No treaty, arrangement, or undertaking shall be entered upon in the name of Great Britain without the sanction of Parliament. Adequate machinery for ensuring democratic control of foreign policy shall be created.

3. The foreign policy of Great Britain shall not be aimed at creating alliances for the purpose of maintaining the balance of power, but shall be directed to concerted action between the Powers, and the setting up of an International Council, whose deliberations and decisions shall be public, with such machinery for securing international agreement as shall be the guarantee of an abiding peace.

4. Great Britain shall propose, as part of the peace settlement, a plan for the drastic reduction, by consent, of the armaments of all the belligerent Powers, and to facilitate that policy shall attempt to secure the general nationalization of the manufacture of armaments, and the control of the export of armaments by one country to another.

What was very properly designated as a "real peace congress" was the Pan-American Financial Conference called by the American Secretary of the Treasury, William G. McAdoo. It began with an informal meeting of the secretary with the delegates, May 22, and lasted during the following week. Nineteen of the twenty-one American republics were represented at the conference by official persons, ministers of finance, leaders in the commerce and industries of their respective countries—men with the right to speak in the name of the nations they represented as men of affairs, financiers, and merchants. The President of the United States voiced the object of the conference in his opening address when he said that his welcome was inspired by what he hoped to be the high ambitions of those who live on these two great continents, "who seek to set an example to the world in freedom of institutions, freedom of trade, and intelligence of mutual service."

The Second Pan-American Scientific Congress (q.v.) which met in Washington December, 1915–January, 1916, was another real peace congress of the same general character.

The American Peace Centenary Committee to celebrate the 100 years of peace between the United States and Canada (*YEAR BOOK*, 1914), kept up its organization with the expectation of formally celebrating when the European war should be concluded. As a memorial of the "Century of Peace" a medal was designed. Silver and bronze copies of the medal were to be struck by the United States Mint for distribution. The proceeds from the sale, above the cost of production, were to be turned into the treasury of the American Committee to meet in part the expense of casting a statue of Abraham Lincoln, which, at the celebration to be held after the close of the war, was to be presented to the people of the British Empire and placed on a pedestal opposite Westminster Abbey and the Parliament buildings in London; and also that of preparing bronze effigies for the Parkman memorial which was to be presented to the people of Canada and placed on a conspicuous site in the grounds of the Parliament buildings in Ottawa.

A World Court to settle international differ-

ences was the demand of a largely attended conference at Cleveland, May 12-13. A League to Enforce Peace was the outcome of another representative gathering held in Independence Hall, Philadelphia, June 16th.

The American Peace Society was undergoing a reorganization designed to render it more effective. The general propaganda has been carried on without abatement, notwithstanding the war. In the words of the report of the executive committee:

"The peace work of the year has been greatly disorganized, if not indeed much retarded, by the war. This has been the case particularly in Europe, where most of the international peace activities have heretofore been carried on within the countries now involved in the war. The great annual international conferences and congresses, including the Third Hague Conference, which it was hoped to hold this year, all had to be postponed indefinitely. Efforts were made to convene the Commission of the International Peace Bureau at Berne after the outbreak of the war, and finally, on Jan. 6 and 7, 1915, an extraordinary session was summoned. Sixteen members of the commission were able to respond. Appeals were issued, questions of ways and means discussed, and a programme drawn up which included the chief points to be embodied in the permanent treaty of peace which will follow the war. The chief value of the meeting was probably the friendly communion between the pacifists of the belligerent and neutral states and the strengthening of their faith in the ultimate triumph of the ideals of peace."

At the extraordinary session of the Council of the International Peace Bureau, held January 6 and 7, at Berne, Switzerland, there were 16 present besides the secretary, M. Golay. The countries represented were: Austria, one; Belgium, two; Germany, three; Great Britain, one; Holland, three; Hungary, two; Italy, one; Switzerland, three. None of the American members was able to make the journey. One of the matters discussed, aside from the all-important question of the conditions of a stable peace to be established after the conflict is ended, was the financial position in which the bureau finds itself as a result of the decision of the trustees of the Carnegie Endowment not to make any grants for peace work in Europe while the war continues. Ways and means were carefully canvassed for securing the needful resources to enable the bureau to continue its work during the war, and to prepare for its enlarged activities when the conflict is over.

An International Peace Congress was held in San Francisco October 10-12, the purpose of which was to bring together, as far as possible, representative leaders from all nations and from all organizations "that favor world peace, in order to confer on the most practical plans for the putting into coöperative action those forces and agencies that will lead to the abolition of war."

The Lake Mohonk Conference on International Arbitration, although meeting in 1915 in circumstances that tended to discourage the hopes entertained by many as to the maintenance of general peace, particularly among the larger and more powerful nations of the world, reaffirmed its faith in the beneficence of the measures for the advancement of which the conference was founded, believing that the present war daily

furnishes convincing proof of the superiority of those methods over the resort to violence.

The conference deemed it to be opportune, in the midst of the present convulsion in Europe, to call attention to what has been accomplished since the Napoleonic wars, in: (1) The development of International Law; (2) the growing sense of obligation and duty between nation and nation; (3) the increasing interdependence and coöperation among nations; (4) the wider application of the federal principle; and (5) the tendency toward broad alliances or groupings for the accomplishment of international ends.

"We express our gratitude," the platform declared, "to the President of the United States for steadfastly maintaining the neutrality of our government and for asserting, with firmness, clarity, and restraint, the rights of our people as citizens of a neutral nation."

"We invite the thoughtful attention of all peoples and nations seeking a substitute for war to a consideration of the three following proposals, as a basis for joint action by any two or more powers, to be binding on the signatories:

"I. All justiciable questions arising between the signatory powers, not settled by negotiation, shall be submitted to a judicial tribunal for hearing and judgment both upon the merits of the case and upon any question of jurisdiction."

"II. All non-justiciable questions arising between the signatories, and not settled by negotiation, shall be submitted to a Council of Inquiry and Conciliation for hearing, consideration, and recommendation."

"III. Conferences between the signatory powers shall be held from time to time to formulate and codify rules of international law, which shall thereafter govern in the decisions of the judicial tribunal mentioned in the first proposal."

The Federal Council of the Churches of Christ in America through its Commission of Christian Education prepared a course of 13 lessons on International Peace, A Study in Christian Fraternity. This course was published during October, November, and December in the *Sunday School* and other periodicals of the various religious bodies affiliated with the Federal Council. These lessons were assured a circulation of 3,000,000 among senior and adult Sunday school classes, and it is expected that their distribution will ultimately reach 5,000,000.

While not discussing the present war, these studies aimed to create and crystallize sentiment among professing Christians in the interests of international fraternity and inter-racial sympathy and appreciation. The lessons will be printed and distributed both in English and in German. The lessons were also accompanied by a service book and full commentary.

Dr. Frederick Lynch, secretary of the Church Peace Union, announced in the daily press of December 17th that the union was unqualifiedly opposed to the present day demand for increased armaments for the United States, and that the trustees had decided that not only should an appeal be made to the people to withstand such a demand, but that Congress should be asked to discover how the \$250,000,000 now spent annually on our defenses may be more effectively expended, if it is true that neither the army nor the navy is efficient in spite of that enormous expenditure.

The stand of the Church Peace Union was out-

lined in the following resolution calling upon men everywhere to renounce the policy of armed peace, which was passed at the meeting of the trustees held in New York City at the residence of the president, the Rt. Rev. David H. Greer, the (Episcopal) Bishop of New York: "Resolved, that we appeal to the American people to withstand the present demand for increased armament for the United States. We are already spending each year the enormous sum of \$250,000,000 on the army and navy, and if neither of these is now efficient we would ask that Congress discover how the money of the people may be more effectively expended.

Upon the hearts of the American people we would enroll the duty of national preparedness in mind and spirit, that we may worthily meet the crucial situation by which we are now confronted. Military preparedness having proved to be inadequate as a safeguard to the world's peace, we call upon men everywhere to renounce the policy of armed peace and to seek and follow a better way."

The American Society for Judicial Settlement of International Disputes held its annual meeting in Washington in December.

A National Peace Federation with headquarters at 116 South Michigan Avenue, Chicago, was formed; as also an International Peace Forum with headquarters at 18 East 41st Street, New York.

INTERMENT OF THE NAVAL VESSELS. See under UNITED STATES AND THE WAR.

INTERSTATE COMMERCE COMMISSION. See RAILWAYS.

IOWA. POPULATION. The estimated population of the State on July 31, 1915, was 2,221,038. The population in 1910 was 2,224,771.

AGRICULTURE. The acreage, production, and value of the principal crops estimated by the United States Department of Agriculture in 1914-15 were as follows:

		Acreage	Prod. Bu.	Value
Corn	1915	10,100,000	803,000,000	\$154,530,000
	1914	10,248,000	839,424,000	214,183,000
Wheat	1915	785,000	15,557,000	18,535,000
	1914	810,000	15,066,000	14,468,000
Oats	1915	4,950,000	198,000,000	63,360,000
	1914	5,000,000	185,000,000	67,650,000
Rye	1915	60,000	1,110,000	888,000
	1914	59,000	1,121,000	868,000
Barley	1915	853,000	10,943,000	5,362,000
	1914	860,000	9,860,000	5,148,000
Potatoes	1915	148,000	15,640,000	8,392,000
	1914	147,000	12,642,000	7,459,000
Hay	1915	3,098,000	5,576,000	48,511,000
	1914	2,950,000	4,071,000	41,117,000

a Tons.

LIVE STOCK. The United States Department of Agriculture estimated that on Jan. 1, 1916, and Jan. 1, 1915, horses numbered 1,584,000 and 1,600,000, valued at \$166,320,000 and \$168,000,000; mules numbered 61,000 and 58,000, valued at \$6,710,000 and \$6,438,000; milch cows numbered 1,391,000 and 1,377,000, valued at \$81,374,000 and \$78,489,000; other cattle numbered 2,737,000 and 2,683,000, valued at \$104,827,000 and \$100,612,000; sheep numbered 1,274,000 and 1,249,000, valued at \$8,026,000 and \$6,994,000; swine numbered 9,069,000 and 8,720,000, valued at \$84,342,000 and \$95,920,000. The production of wool in 1915 and 1914 was 5,319,000 and 5,400,000 pounds respectively.

MINERAL PRODUCTION. The coal production

of the State in 1914 showed a decrease of 1 per cent as compared with 1913, the output in 1914 being 7,451,022 short tons, valued at \$13,364,070. The smaller demand for coal in the East caused a larger quantity of coal from West Virginia and other Eastern States to seek markets in the Northwest, displacing Iowa coal. The number of men employed in the coal mines of Iowa increased from 15,757 in 1913 to 16,057 in 1914. The value of the total mineral production in 1914 was \$26,287,115, compared with \$25,602,015 in 1913.

EDUCATION. The total school population in 1915 was 678,192. The total enrollment in the public school was 522,423, and the average daily attendance was 391,131. The female teachers numbered 24,163, and male teachers 2628. The average monthly salary of male teachers was \$89.17, and female teachers \$54.07. The total school expenditures for the year were \$18,704,972.

FINANCE. The report of the treasurer for the biennial period ending June 30, 1914, showed a balance on hand on July 1, 1912 of \$1,041,486. The total receipts for the period from all sources amounted to \$11,524,770, and the total expenditures to \$11,828,396, leaving a balance on hand June 30, 1914, of \$737,860. The State has no bonded debt.

CHARITIES AND CORRECTIONS. The charitable and correctional institutions under the State Board of Control include the Soldiers' Home at Marshalltown, Soldiers' Orphans' Home at Davenport, School for the Deaf at Council Bluffs, Institute for Feeble-Minded Children at Glenwood, State Sanitarium for the Treatment of Tuberculosis at Oakdale, Industrial School for Boys at Eldora, Industrial School for Girls at Mitchellville, Mount Pleasant State Hospital, Independence State Hospital, Clarinda State Hospital, Cherokee State Hospital, State Hospital for Inebriates at Knoxville, State Penitentiary at Fort Madison, and the Reformatory at Anamosa. The total average population of these institutions for the fiscal year ending June 30, 1915, was 9964. For their support \$2,486,800 was spent.

TRANSPORTATION. The total mileage of railways in the State on Jan. 1, 1915, was 10,016. Railroads having the longest mileage were the Chicago, Burlington, and Quincy, 1666; Chicago Great Western, 1769; Chicago, Milwaukee, and St. Paul, 1867; Chicago and North Western, 1610; Minneapolis and St. Louis, 798; and Dubuque and Sioux City, 716.

POLITICS AND GOVERNMENT. The Legislature met in 1915 and passed many measures of importance. In addition to those mentioned below, see ELECTORAL REFORM, LEGISLATION IN 1915, and LIQUOR REGULATION.

The Senate on February 12th passed the Clarkson bill, which provides for the repeal of the so-called "mulct" liquor law. The same bill was passed by the House on February 18th. The measure was to become effective on July 1, 1916. Its purpose was to provide statutory prohibition pending action on the constitutional amendment. A bill providing for the submission of the question of prohibition to the people was passed by both Senate and House, and was signed by the Governor. This bill provided for submission to the people of the question of constitutional prohibition after it passes in the Legislature convening in 1917. The Legislature

passed a bill providing for the submission of a woman suffrage amendment to the people in the November election in 1917. The measure had already been passed by two successive Legislatures. A stringent child labor law was also passed at this session of the Legislature. The contract prison labor system was abolished.

STATE GOVERNMENT. Governor, George W. Clarke; Lieutenant-Governor, William L. Harding; Secretary of State, William S. Allen; Auditor, Frank F. Shaw; Commissioner of Insurance, Emory H. English; Treasurer, William C. Brown; Superintendent of Public Instruction, Albert M. Deyoe; Registrar of the Land Office, James K. Powers.

JUDICIARY. Supreme Court: Scott M. Ladd, Silas M. Weaver, William D. Evans, Bryan W. Preston, Forrest E. Deemer, Frank R. Gaynor, Benjamin I. Selinger.

STATE LEGISLATURE:

	Senate	House	Joint Ballot
Republicans	35	75	110
Democrats	15	32	47
Independents	1	1	1
Republican majority..	20	42	62

IOWA, STATE UNIVERSITY OF. A State institution for higher learning founded in 1847 at Iowa City, Iowa. The total enrollment in all departments in the autumn of 1915 was 2737, distributed as follows: liberal arts 1512, graduate school 189, school of applied science 243, law school 153, school of medicine 154, school of homeopathic medicine 10, school of dentistry 304, school of pharmacy 72, school of music 64, school of medical nurses 82, school of homeopathic nurses 16. The faculty numbered 298. Among the new members of the faculty for the year 1915-16 were the following: Dr. G. G. Benjamin, professor of history; Dr. M. A. Brisco, professor and head of the department of economics; M. L. Person, professor of law; Dr. W. T. Graham, superintendent of the university hospital; Mr. F. C. Ensign, professor of education; Prof. C. H. Dorcas, registrar. The university received in 1915 a bequest from the late John F. Dillon, of New York City, of \$10,000, the income of which is to be paid for providing prizes for essays on legal topics, and for scholarship for the aid of law students. The annual income of the university from all sources in 1914-15 was \$986,513. There were received from State appropriations and other State sources \$776,199. The endowment fund amounted to about \$495,000, and the value of the property to \$3,885,953. The library contains about 118,000 volumes. President, Thomas H. Macbride, Ph.D.

IRELAND. See GREAT BRITAIN.

IRON. See CHEMISTRY, INDUSTRIAL, *Iron and Steel*; FINANCIAL REVIEW, *Pig Iron Production*; IRON AND STEEL; METALLURGY; PIG IRON.

IRON AND STEEL. The quantity of crude ore mined in the United States amounted in 1914 to 41,439,761 long tons, compared with 61,980,437 long tons in 1913, a decrease of over 33 per cent. The iron ore marketed in the same year amounted to 39,714,280 long tons, valued at \$71,905,079, compared with 59,643,098 long tons valued at \$130,905,558, marketed in 1913. This represents a decrease of over 33 per cent in quantity and 45 per cent in value. Iron ore

was mined during the year in 27 States, compared with 28 States in 1913. The five States producing the largest quantity were in the order of importance of production: Minnesota, Michigan, Alabama, Wisconsin, and New York. The Minnesota iron ranges produce more iron than is produced in all the rest of the States together. The Lake Superior district, comprising all the mines in Minnesota and Michigan, and those in northern Wisconsin, mined 33,540,403 long tons in 1914, or nearly 81 per cent of the total produced. The following table gives the quantity and value of iron marketed in the United States in 1913-14:

State	1913		1914	
	Quantity, in long tons	Value	Quantity, in long tons	Value
Ala. . .	5,338,218	\$6,648,569	4,514,926	\$5,727,619
Cal. . .	(a)	(a)	1,282	5,128
Colo. . .	(a)	(a)	11,464	22,846
Ga. . .	153,386	237,876	66,222	119,368
Md. . .	(a)	(a)	749	1,817
Mich. . .	12,668,560	33,479,954	8,533,280	18,722,358
Minn. . .	36,603,331	80,789,025	23,298,547	40,628,771
Mo. . .	37,134	83,628	36,304	75,696
Mont. . .	2,475	7,425	(a)	(a)
N. J. . .	291,653	980,303	346,820	1,076,208
N. Mex. . .	164,085	148,405	(a)	(a)
N. Y. . .	1,420,889	3,100,235	640,252	1,992,892
Ohio . .	8,299	17,100	(a)	(a)
Pa. . .	478,693	589,038	400,062	399,639
Tenn. . .	864,092	498,556	330,214	466,523
Utah . .	14,690	44,628	(a)	(a)
Va. . .	492,649	983,279	346,382	719,415
Wis. . .	896,243	2,149,397	591,595	1,178,610
Other States	713,751	1,153,140	596,181	768,194
Total	59,643,098	130,905,558	39,714,280	71,905,079

a Increases or decreases for California, Colorado, Maryland, Montana, New Mexico, Ohio, and Utah included with those for "Other States."

IMPORTS AND EXPORTS OF ORE. There were imported into the United States in 1914, 1,350,588 long tons, valued at \$4,483,832. Cuba produced approximately 60 per cent of the ore, and the remainder came from Sweden, Spain, and Canada. There were exported from the United States in 1914, 551,618 long tons, valued at \$1,794,193. This was a decrease of about 47 per cent from the exports of 1913.

WORLD PRODUCTION. The following table gives the production of iron ore in the different countries in 1913-14.

Country	1913	1914
North America:		
Canada	274,673	218,620
Cuba	1,582,431	821,110
Newfoundland	(a)	(a)
United States	61,980,437	41,439,761
South America:		
Chile	(a)	(a)
Europe:		
Austria-Hungary	5,018,109	(a)
Belgium	(a)	(a)
France	21,572,835	(a)
Ger. Empire and Luxemburg	26,771,598	(a)
Greece	305,195	(a)
Italy	593,618	(a)
Norway	77,693	(a)
Portugal	48,407	(a)
Russia	(a)	(a)
Spain	9,706,366	(a)
Sweden	7,857,845	(a)
United Kingdom	15,997,828	(a)
Asia:		
China	269,748	(a)
India	(a)	(a)
Japan	(a)	(a)
Chosen (Korea)	(a)	(a)
Philippine Islands	546	(a)

Country	1913	1914
Africa:		
Algeria	(a)	(a)
Madagascar	(a)	(a)
Natal	(a)	(a)
Togoland	(a)	(a)
Tunis	(a)	(a)
Australia	(a)	(a)

a Statistics not available.

EXPORTS AND IMPORTS OF PIG IRON. The imports of pig iron in 1914 amounted to 138,903 long tons, compared with 156,450 long tons in 1913. The exports amounted to 114,423 long tons, compared with 277,648 long tons in 1913. The largest quantity was shipped to Canada, and important quantities were shipped to Italy, England, Tasmania and Australia, and Panama.

STEEL. The production of all kinds of steel ingots and castings in 1914 was 23,513,030 long tons, compared with 31,300,874 in 1914. The various kinds of steel ingots and castings produced in the different States are shown in the following table:

State	1913			1914				
	Bessemer	Open-hearth	Crucible and all other	Total ingots and castings	Bessemer	Open-hearth	Crucible and all other	Total ingots and castings
Massachusetts, Rhode Island, and Connecticut				200,611	2,200	187,962	1,521	141,683
New York and New Jersey	871,372	996,812	89,032	1,406,716	128,185	719,227	84,388	881,795
Pennsylvania	2,954,818	12,522,227	77,249	15,554,294	2,014,526	9,854,038	56,212	11,924,776
Delaware, Maryland, District of Columbia, Virginia, West Virginia, Kentucky, Tennessee, Georgia, Alabama, Louisiana, and Texas.	687,063	1,183,977	1,285	1,822,325	325,293	848,857	1,275	1,175,425
Ohio	4,024,662	2,726,219	4,170	6,755,051	2,862,700	2,592,778	2,905	5,458,383
Indiana and Illinois	1,475,424	8,444,960	20,600	4,940,984	871,210	2,525,450	18,989	3,410,649
Other States a	79,891	530,817	10,185	620,893	16,732	496,372	7,215	520,319
Total	9,545,706	21,599,931	155,287	31,300,874	6,220,846	17,174,684	117,500	23,513,030

a Figures for 1913 and 1914 include Canal Zone.

See **CHEMISTRY, INDUSTRIAL**; and **PIG IRON**.

The American iron and steel industry in 1915 enjoyed an extraordinary recovery from the depression of 1914. At the beginning of the year the steel works were operated at only about 40 per cent of their capacity, and even that was an improvement over the later months of 1914, when the rate of production had sunk as low as 25 to 30 per cent of capacity. In December, 1915, on the other hand, practically all American works were running to full capacity and were behind with orders. This was true not only for war munitions and supplies, but also for structural materials and railway rails. On December 31st there were 296 coke furnaces producing at the rate of 105,400 tons a day, and a

record of 3,203,322 gross tons of pig iron was made for the month. Early in 1915 prices increased—an increase in many cases directly due to European orders, as in the wire trade, where barbed wire was in great demand for Europe. Heavy steel products were also in demand, and an advance of \$1 per ton was made in March, and was followed by a similar advance in April. Pig iron lagged behind steel in activity and prices, but by April it had increased and continued so that in December the various furnaces were producing at a rate of 38,000,000 tons per year, far in excess of any previous record, and practically double that of January. The year's development in the industry is shown in the accompanying tables. For the manufacture of shrapnel, steel bars were in great demand, and many mills, ordinarily rolling mills, turned their attention to bars. By the middle of the year the buying of rails by American railways began with vigor, and this indicated the general trend of prosperity.

Of course, the war served to increase the Amer-

ican export trade, and there was a demand not only for pig iron but for rails, steel blooms, billets, tin plates, steel ties, and other products which ordinarily would have been supplied from Europe. As a result prices increased during the year on almost all products. At the close of the year the American production of steel ingots was estimated as being close to the rate of 40,000,000 tons per year, and practically every steel plant, rolling mill, and blast furnace was in active operation.

In Great Britain the iron and steel industry was concerned chiefly with armaments, and considerable armor plate for the biggest warships was for a time under construction, as well as other materials for the government and its allies.

PRODUCTION OF COKE AND ANTHRACITE PIG IRON IN THE UNITED STATES BY MONTHS—GROSS TONS

	1911	1912	1913	1914	1915
January	1,759,326	2,057,911	2,795,331	1,885,054	1,601,421
February	1,794,509	2,100,815	2,586,387	1,888,670	1,674,771
March	2,171,111	2,405,818	2,763,563	2,347,867	2,068,834
April	2,064,086	2,375,436	2,752,761	2,269,655	2,116,494
May	1,893,456	2,512,582	2,822,217	2,092,686	2,263,470
June	1,787,566	2,440,745	2,628,565	1,917,783	2,380,827
July	1,793,068	2,410,889	2,560,646	1,957,645	2,568,420
August	1,926,637	2,512,431	2,545,763	1,995,261	2,779,647
September	1,997,102	2,463,839	2,505,927	1,882,577	2,852,561
October	2,102,147	2,689,933	2,546,261	1,778,186	3,125,491
November	1,999,433	2,630,854	2,233,123	1,518,316	3,037,308
December	2,043,270	2,782,737	1,983,607	1,515,752	3,203,822
Total, year	23,831,711	29,383,490	30,724,101	23,049,752	29,662,566

Later, the Munitions Act gave the government power to control steel firms and other branches of industry, and by the middle of the year this policy was in full operation and new factories were being built for the manufacture of various war munitions. The government made great demands on makers of rolled steel, but there was naturally a diminution of the export business and in the calls for finished materials from the colonies. It was claimed that steel was being shipped to the Teutonic nations through neutrals, and accordingly an embargo was placed on steel about the middle of the year, which somewhat complicated the industry and particularly the export trade.

The shortage of labor was also a serious consideration in the British iron and steel industry, and showed a lack of the attention to this subject, which was so evident in Germany, where careful means were taken not to recruit the military forces at the expense of the essential industries.

IRRIGATION. Throughout the world the year 1915 was one of continued inactivity in the undertaking of new irrigation enterprises. Another noticeable fact was that nowhere in the world was any irrigation construction of magnitude being carried on by any except governmental agencies. In North America the prevailing stagnation in irrigation construction seemed to be due to over construction in the recent past, and to the general unsettled conditions in Mexico. In both Canada and the United States there are large areas already supplied with water which await settlement, and consequently it is difficult to get capital for further construction. The progress of irrigation development for the year 1915 is summarized in the following paragraphs.

UNITED STATES. Irrigation construction in the United States has been confined almost exclusively to projects of the United States Reclamation Service begun in former years. Few, if any, new projects are being undertaken. While the service has been expending large sums in pushing to completion the projects under way, it has been devoting much more attention than formerly to the problems of settlement and to the success of the settlers already on the land. The annual report for 1915 showed that but little more than one-half the land to which the service was ready to supply water was irrigated, while the settlers who were on the land had not been able to make their payments. In 1914 Congress extended the time of payment of construction charges to 20 years, with no payments except for maintenance and operation for five years after the charge has been fixed. There was much controversy between the service and the settlers as to the amount of the construction charges to be paid by the settlers, and as a preliminary to putting the twenty-payment law into effect the Secretary of the Interior created a local board for each project to review the whole matter of costs and recommend a basis of settlement in each instance. A central board was created and empowered to pass on the reports of the local boards and make final recommendations as to the charges for each project. No reports had been made public, and pending such reports, the projects were being operated on temporary rental agreements. The annual report of the Reclamation Service for the fiscal year ending

June 30, 1915, showed the condition of the service to be as follows: The total receipts from the sale of public lands assigned to the reclamation fund up to June 30, 1915, were \$87,584,493.30. In addition to this the service had available a loan from the United States Treasury of \$20,000,000, and the receipts from the repayments to the fund. The total allotment to projects was \$121,951,997.78, and the amount expended was \$111,095,700.51. The acreage included in projects is 2,921,165, and the service was ready to supply water for the season of 1914 to 1,343,193 acres. The acreage covered by water right applications and rental agreements—that is, the acreage covered by some sort of agreements to take and pay for water—was 983,487 acres. The acreage irrigated in 1914 was 761,271 acres, an increase of about 61,000 acres over that irrigated in 1913. There was, therefore, an area of 359,706 acres for which water was available that was not covered by agreements, and an area of 581,922 acres for which water was ready that was not irrigated. Under the reclamation law the cost of construction is to be returned to the reclamation fund, and up to June 30, 1915, the receipts from payments of building charges amounted to \$3,575,468.90, those from operation and maintenance charges amounted to \$2,067,255.07, while temporary rentals amounted to \$2,707,529.08.

The operations under the Carey Act (Act of Aug. 18, 1894, granting desert land to the States on condition that they provide for their irrigation) indicated further the lack of activity in new irrigation enterprises. During the year ending June 30, 1914, the last year for which the figures were available, there were applications for segregations under this law amounting to 21,766.48 acres, there was segregated an area of 6237.70 acres, and patents were issued for 30,006.16 acres. From the date of the passage of this act to June 30, 1914, the area applied for was 7,682,445.33 acres, the area segregated was 3,692,230.01 acres, and the area patented was 460,054.23 acres. The very large difference between the area segregated and the area patented is explained by the annual report of the Commissioner of the General Land Office as follows:

"From the best information available in this office it appears that of the total of over 2,850,000 acres now segregated more than 1,500,000 acres are included in segregations on account of about 34 proposed schemes and projects which are at a standstill, or which are wholly or in part failures, by reason of financial difficulties, engineering difficulties, erroneous estimates of water supply, mismanagement, or a combination of two or more of these causes. Of the above projects, six, covering over 180,000 acres, are at a standstill by reason of difficulties not known to this office; nine projects, covering over 850,000 acres, are reported to be held up chiefly by reason of financial troubles; four projects, covering about 200,000 acres, are reported to be held up chiefly because of engineering difficulties; five projects, covering over 125,000 acres, are reported in trouble because of erroneous estimates of water supply; three projects, covering over 130,000 acres, are said to be in trouble because of difficulty in securing satisfactory title to essential units; three projects, covering over 65,000 acres, are at a stand-

still because of accident or damage to structures after construction, and the chief trouble with four projects, covering over 70,000 acres, seems to be purely bad management, dissension, or litigation. It is probably safe to say that usually the troubles have not been one, but a combination of two or more of those above mentioned."

The general stagnation in irrigation development during the last two or three years led to much discussion of possible methods of reviving irrigation construction. The immediate cause of the cessation of irrigation construction is the impossibility of financing new enterprises, and most of the discussion has to do with this matter. The most common proposal was the placing of the credit of the States or the Federal government behind the securities to be sold for the purpose of raising funds. Various schemes for accomplishing this were proposed, the most common one being the guaranteeing of the interest on irrigation district bonds by either the States or the general government. It was also proposed that the Federal government accept district bonds in payment of construction charges on its reclamation projects, thus relieving the reclamation fund for new works. A Federal bond issue of \$100,000,000 for new projects was proposed also. Owing to the condition of Federal revenues and the lack of effective demand for irrigated lands it did not seem likely that any of these proposals would be realized. Several of the States had attempted to aid the sale of irrigation securities without themselves assuming any financial responsibility by extending their public supervision of irrigation districts, but so far this had been without marked effect. The most urgent need of the arid region of the United States at the present time is not, however, the construction of more irrigation works, but the settlement of lands already supplied with water, and the more complete utilization of works already built. It is coming to be quite generally believed that the success of both Federal and private projects will require some form of public aid in getting settlers on the lands, and in giving them a start. Definite plans for this have not been formulated, however.

CANADA. In Canada, as in the United States, there was practically no construction of new projects in 1915. The Canadian Pacific Railway Company, which controls most of the irrigation development in Canada, was working principally on the settlement of its lands already supplied with water. In the Province of British Columbia, which in 1914 enacted a new code of water laws, including a law for the organization of irrigation districts, one small district was in the process of organization, but otherwise there was no activity in the province.

MEXICO. The unsettled conditions in Mexico prevented any attempts at irrigation development.

PERU. The Government of Peru had not yet begun active work on a large scale on the programme of irrigation construction authorized in 1913. This law provides for a loan of 2,000,000 pounds sterling to be used in irrigation work, to be done either directly by the government or through concessions.

ARGENTINA. The Argentine government had continued its authorization of small projects,

but had not during 1915 undertaken any large development.

EASTERN HEMISPHERE. The European war brought new irrigation development in the Eastern Hemisphere almost to a standstill, as neither capital nor men were available for such work. The Japanese government began a few years ago an extensive series of projects in Formosa, 14 projects being included in the programme. Three of these had been completed in 1915, and work on the fourth was in progress. It was expected that the others would be taken up in order. In the same way the Dutch government was engaged in a series of projects in Java, on which work was progressing. In Australia the governments of Victoria and New South Wales were continuing the construction of their works begun in former years, and, like the United States, were working with the problems of successfully settling the lands as water was made available.

ISHERWOOD, BENJAMIN FRANKLIN. An American rear admiral, retired, died June 19, 1915. He was born in 1822, and in 1844 entered the United States navy. He became chief engineer in 1848, and from 1861-69 was engineer-in-chief of the navy. He was afterwards at Mare Island Navy Yard, California, and held special duties. He was retired by an operation of the law in 1884.

ISOSTASY. See GEOLOGY.

ISOTROPIC ELEMENTS. See CHEMISTRY.

ISTRIA. See AUSTRIA-HUNGARY.

ITALIAN LITERATURE. Italian literature, as was pointed out in the 1913 YEAR BOOK, has concerned itself primarily with the expression and consolidation of the new national spirit, turning the regional divergencies of interest and temper to subserve the purposes of patriotism by stressing the glories of a classic heritage which, in its wider aspects, also embraces the Church. In May Italy, of all the belligerent nations, had a literary man great enough to awaken all the energies of this cultural tradition and unite the national emotion in the hour of crisis. Gabriele d'Annunzio has been for the Allies a whole campaign in himself. We have to look back to the return of Voltaire to Paris in 1778 to find a literary man, acting purely as a literary man, looming so large on a political horizon so fraught with omen. In a volume entitled *Per la più grande Italia*, d'Annunzio's speeches just before the outbreak, his telegrams and letters, give some impression of his activity and some inkling of the secret of his power. There is the usual splendor of d'Annunzian imagery, there is the glory of the past and the hope of the future, mingling in the invective against Austria and the triumphant chant to the greatness of Italy. It has been for d'Annunzio a complete rehabilitation. By his words and acts with army, fleet, and aviators, this poet has become the living symbol of warlike Italy. In d'Annunzio's ante-bellum work was already to be noted a trend toward religious mysticism. He has just published in the *Eroica* of E. Costanzi (Spezia) a prospectus of *La crociata degli innocenti*, the action of which is laid "in the time when Saint Francis of Assisi was 30 years old." The verses show many recollections of Jacopone da Todi and the Umbrians of the Duecento.

Three other documents figured largely also in the early appeal to the spirit of the Italian

people: Salandra's *Discorso in Campidoglio* of June 2 (see *Diario della guerra*, Milan, Treves), the official character of which gave it a vogue not to be explained by its artistic merit; the lecture-oration of Italy's greatest public speaker, Antonio Fradeletto of Venice, *Dall'alleanza alla guerra* (Milan, Treves); and, curiously enough, the drama *Romanticismo* of Rovetta, which, on its production 30 years ago was suppressed by decree, but has been revived with astounding success. The most elegant war writer has proved to be Luigi Barzini, a journalist, whose work is appearing in a seven volume series, *Scene della grande guerra*. We may recall that Barzini's popularity began with his reports on the Mexican crisis, where he showed himself bitterly hostile to the United States. It is typical of the times that one of Barzini's most artistic productions should be the essay entitled *Cannon and Munitions*. The war writing of Paolo Orano (Milan, Treves) has been almost as much read. The leading military critic is C. Baroni (*Giornale d'Italia*). Guelfo Civinini, novelist and playwright, has written some astonishingly prophetic and discerning articles from Athens, Sofia, and Bucharest. For the rest, the most informing books about the technique of warfare have been *La guerra nel cielo* of F. S. di Brazzà; *Sottomarini, sommergibili e torpedini* of E. Bravetta; *La marina nella guerra attuale* of L. Zingarelli. For a comprehensive review of internal Italy see the considerable series *L'Italia d'oggi*, edited by Bontempelli, Rome. The review *Scientia* (Bologna) has been studying the war from a very unusual and unbiased point of view. Guglielmo Ferrero has written *La guerra europea* with passages of characteristic brilliancy on German culture, which has found a more sympathetic critic in G. A. Borghese, *Italia e Germania. Why Italy is at War* of Pietro Fedele has been distributed abroad. Ezio Gray's *Invasione tedesca in Italia* contained some rather sensational gossip. The emotional historical article, especially on subjects dealing with the Italian territories in dispute, has crowded out most other forms of non-journalistic writing save the drama.

DRAMA. The drama immediately assumed its war paint, but, if anything, gained in vitality. An almost unheard-of thing, the theatres remained open during the whole summer as perhaps the sole diversion of the civilian population and as powerful auxiliaries of public charity. Revivals of plays from the old Risorgimento stock, such as *Troppo tardi* of T. Ciconi, were numerous. Goldoni, Sugana, Piloto became new favorites acted by Emilio Zago. For the actor Ermete Zacconi, Domenico Tumiati has produced a dramatic history of the struggle for Italian independence, of which have appeared *Il tessitore*, *La meteora*, *Carlo Alberto*, *La giovine Italia*, *Garibaldi*, and *Poerio*. This is the most bulky exploitation of the war spirit which has produced numberless plays like *Sull'Isoneo* of E. Collaredo, and *L'alto Isoneo* of G. Zucca.

The number of novelties meanwhile from pacific sources of inspiration seems not to have diminished appreciably. Sem Benelli's *Nozze dei centauri* is almost a repetition of his earlier *Rosmunda*: the charm of Italy which succumbs to barbaric violence of the North only to destroy the ravisher. Niccodemi's *Ombra* was given also in English in New York by Ethel

Barrymore. It is a good portrayal of feminine idealism on the background of corrupt male chivalric prejudice. Niccodemi's growing fame was honored during the summer by his native city Livorno. Alfredo Testoni's new play, *Il pomo della discordia*, like his numerous other comedies, shows the overpowering sense of fun which, in his Bolognese dialect production, marked him as a man of promise. He has, however, never risen beyond the level of serious observation of life attained in his classic *Cardinale Lambertini*, and he bids fair to remain a mere Sardou. We note with pleasure two epigones of the Goldoni-Gallina tradition: G. Cenozato's *La sposa segreta* and *Per la regola* (in Venetian dialect) of Domenico Varagnolo. Mario Cortesi has tried again the well-worn theme of *Nerone* (see YEAR BOOK, 1913), showing simply that the classic tragedy in Italy refuses to stay buried. The *Superstite* of S. Rizzone Viola was a failure. The best new comedy-drama of the year was *Il cuore e il mondo* of Lorenzo Ruggi: the hero in the first two acts overcomes his chivalric prepossessions through love, only to succumb to "society" represented by family associates. The *Gazzetta di Venezia* has published the memoirs of the actor Anzolo Morolin. The year has been disastrous in the loss of the actors Flavio Andò, Alberto Giovannini, and Edoardo Ferravilla. Other plays: Luigi Antonelli, *Teatro completo*; G. Adam, *I capelli bianchi*; G. Antona-Traversi, *La grande ombra*; Fratta-Tonetti-Nesti, *La risposta del governo*; A. Bruno, *Femmine riluttanti*; Guido Francocci, *Quinzica de' Sismondi* (in verse); Carlo Bertolazzi, *L'egoista*; Nino Berrini, *La dama dell'altra sponda*.

REGIONAL LITERATURE (see YEAR BOOK, 1913). Sicily: G. E. Nuccio, *Sicilia buona*; G. Galati Mosella, *Canzuneddi di cicala* (dialect verse); L. Capuana, *Nostra gente* (tales). Sardinia: Margherita Lunati-Manca, *Terra nostra* (tales); Grazia Deledda, *Il fanciullo nascosto* (novel). Tuscany: Ferdinando Paolieri, *Novelle toscane*. Bari: Davide Lopez, *Canti baresi*.

VERSE (mostly from before the Italian war). Elda Giannelli, *Lyrica* (contains some free verse); Arnaldo Monti, *Quadri e suoni di guerra*; Bruno Vignola, *Accordi*; Luisa Anzoletti, *Canti dell'ora*; Maria Bianco Bufalini, *Umanità*; Rachele Giraldi, *Rane e cicale*; Augusta Mosconi, *La coppa del male e dell'ira*; Pier Eugenio Zemo, *Per il libro delle ore*; Palmina Perrotti, *La conca d'oro*; Vincenzo Migliorini, *Anima Rerum*; Gerlando Lentini, *Eros*; Felice Campania, *Pervigilium*; Ippolito Rossetti, *Echi di Valverde*; Rafaele Valente, *Il mostro*; Lamberto Orsini, *Odi*; Curio Mortari, *Bella*. See also YEAR BOOK for 1914.

TALES. Virgilio Brocchi, *La coda del diavolo*; Amalia Guglielminetti, *Anime allo specchio*; Luciano Zuccoli, *La vita ironica*; Augusta Osimo Muggia, *Rivoli in ombra*; Luciano Folgore (futurist), *Ponti sull'oceano*.

NOVELS. Flavio Steno, *Il miraggio*; Moisé Cecconi, *Il taccuino perduto*; Marcello Arduino, *Ave Caesar*; Arcangelo Pisani, *La fuga*; E. D. Colonna, *Israele*; Guido da Verona, *La donna che inventò l'amore*; Mario Carli, *Retrosceca*; Maria Giusti, *La casa senza lampada*; M. R. del Bava, *Rose delle Alpi*; Luigi Pirandello, *Si gira*.

TRANSLATIONS. From English: Anna Benedetti, *Beowulf*; *Elegie scelte*. From Greek: E. Romagnoli, *Agamemnon* of Æschylus; G. Fracaro, *Prolegomeni* of Pindar; *Le donne a parla-*

mento of Sophocles (into dialect of Verona); C. O. Zuretti, *Frammenti* of Menander; Taccone, *Idili* of Theocritus. From Persian: Italo Pizzi, *Libro dei re* (Firdusi).

EVENTS. Giuseppe Pitrè, the Sicilian folklorist, has been made Senator, as have Allesandro Chiappelli of the *Nuova Antologia* and Luigi Albertini of the *Corriere della sera*. The following died during the year: Enrico Castelvetro, novelist; Edoardo Dalbono, Neapolitan scholar, poet, and novelist; Giovanni Bistolfi, critic and editor; Domenico Gnoli, critic, novelist, scholar; Rodolfo Renier, scholar; Grazia Mancini, poet, dramatist, and novelist; Raffaello Giovagnoli, dramatist, poet, lecturer; Francesco Novati, a distinguished mediaevalist. Alessandro d'Ancona died late in 1914. Renato Serra (Bologna), author of *Lettere* and a popular journalist, has been killed in action.

See also PHILOLOGY, MODERN.

ITALIAN SOMALILAND. An Italian colony in eastern Africa, bordering the coast of the Indian Ocean from the (British) Somaliland Protectorate southward to the Juba River. Estimated area, 357,000 square kilometers (about 137,800 square miles). Estimated population, 300,000. In 1911-12, imports were valued at 5,533,462 lire, and exports 2,055,018; in 1912-13, 6,188,211 and 2,062,692. For 1913-14, the estimated revenue was 6,031,000 lire (local, 852,000; state contribution, 3,629,000; extraordinary, 1,550,000); estimated expenditure, 5,770,999 lire (including 1,052,265 extraordinary). The dependency is administered by a governor, resident at Mogadiscio.

ITALY. A southern European constitutional monarchy, composed of the Apennine Peninsula, the islands of Sicily and Sardinia, and a number of minor islands. The capital is Rome.

	P.	Sq. km.	1901	1911
Basilicata	1	9,962	490,705	474,021
Calabria	3	15,075	1,370,208	1,402,151
Sicily	7	25,789	8,529,799	8,672,258
Sardinia	2	24,109	791,754	852,407
Total	69	*286,682	32,475,253	34,671,337

* 110,688 square miles.

The population given above is the population actually present at the date of the census, the total legal (*de jure*) population on that day being 35,845,048. As calculated Jan. 1, 1914, the total *de facto* population was 35,597,784, the density being about 321.8 per square mile. The population returned as over 15 years of age in 1911 numbered 22,817,755, of whom 8,039,129 were unmarried, 12,613,993 married, 2,147,325 widowed, and 17,308 unascertained. The communal population of Naples in 1911 was 678,031, Milan 599,200, Rome 542,123, Turin 427,106, Palermo 341,088, Genoa 272,222, Florence 232,860, Catania 210,703, Bologna 172,628, Venice 160,719, Messina 126,557, Leghorn 105,315; Bari 103,670, Padua 96,230, Ferrara 95,212, Brescia 83,338, Verona 81,909, Foggia, 76,688.

The number of marriages in 1912 and 1913 respectively was 264,674 and 264,325; living births, 1,133,985 and 1,122,484; stillbirths, 47,571 and 46,871; deaths exclusive of stillbirths, 635,788 and 663,966. Emigrants in 1912 numbered 711,446 (of whom 403,306 went overseas and 308,140 to European countries or other countries on the Mediterranean); in 1913, 872,598 (559,566 and 313,032). Infant, primary, normal, and secondary schools are maintained.

PRODUCTION. In the table below are given the area in hectares sown to principal crops and the yield in metric quintals; with the yield per hectare in 1913-14:

	Hectares		Quintals		Qe. ha.
	1913-14	1914-15	1913-14	1914-15	
Wheat	4,768,530	5,059,500	46,115,030	46,414,000	9.7
Rye	122,500	119,000	1,336,000	1,108,000	10.9
Barley	246,800	246,000	1,505,000	2,406,000	6.1
Oats	491,000	488,800	3,894,000	4,564,000	7.9
Corn	1,500,000	1,600,000	26,000,000	30,000,000	16.9
Rice	146,000	146,000	5,432,000	5,300,000	37.3
Flax *	18,000	18,000	83,000	70,000	4.6
Beets	40,300	50,000	14,000,000	15,000,000	397.5
Vines †	4,858,000	4,400,000	46,000,000	28,000,000	13.0
Tobacco	8,000	8,000	.....	.....	...
Olives †	2,390,000	2,300,000	1,700,000	1,500,300	...
Potatoes	290,000	300,000	16,630,300	16,000,000	57.3

* Production of seed; fibre production was 25,000 qs. in 1913-14.

† Production in hectoliters.

AREA AND POPULATION. The area, in square kilometers (according to the calculations of the Military Geographical Institute), the number of provinces in each compartimento, the population as taken at the census of June 10, 1911, and the population as taken at the census of Feb. 10, 1901, are given, by compartimenti, in the following table:

	P.	Sq. km.	1901	1911
Piedmont	4	29,367	3,317,431	3,424,450
Liguria	2	5,278	1,077,473	1,197,231
Lombardy	8	24,085	4,282,728	4,790,473
Venetia	8	24,547	3,134,467	3,527,360
Emilia	8	20,701	2,445,035	2,681,201
Tuscany	8	24,105	2,549,142	2,694,706
The Marches	4	9,712	1,060,755	1,093,253
Umbria	1	9,709	667,210	686,596
Rome	1	12,081	1,196,909	1,802,424
Abruzzi e Molise	4	16,529	1,441,551	1,430,706
Campania	5	16,295	3,160,448	3,311,990
Apulia	3	19,109	1,959,668	2,130,151

Live stock (1908): 839,723 horses, 388,337 mules, 6,198,861 cattle, 19,266 buffaloes, 11,162,926 sheep, 2,714,878 goats, 2,507,798 swine.

The forest products were valued in 1900 at 124,132,000 lire. Sericulture is carried on throughout the country, particularly in Piedmont and Lombardy. The quantity of eggs placed for hatching in 1913 was 300,000 hectograms, producing 32,000,000 kilograms of cocoons.

Following are the productive mines in operation and the output in metric tons in 1912; and the value, in lire, of the output for 1910 and 1912:

	No.	M. tons	Lire 1912	Lire 1910
Iron	27	582,066	12,406,837	7,619,031
Manganese	5	2,641	99,160	134,793
Copper	7	86,001	1,583,921	1,038,674
Zinc	149,776	18,286,272	14,803,100	14,803,100
Lead	94	41,680	7,785,269	5,303,855
Lead and zinc	300	5,400	8,600	8,600

	No.	M. tons	Lire 1912	Lire 1910
Silver	1	27	77,200	42,400
Gold	2	2,866	66,856	58,730
Antimony ...	2	1,878	112,245	149,769
Mercury	8	88,200	4,370,400	3,729,352
Pyrites	11	277,585	5,966,819	2,864,581
Min. fuel....	42	663,812	6,111,034	4,925,950
Sulphur	358	2,504,408	29,600,684	32,883,409
Asph. & bit..	18	181,946	3,012,848	2,826,670
Boric acid ..	7	2,309	900,510	900,720
Total	656		*94,213,223	*80,867,479

* Including other.

The output of chemical industries was valued in 1912 at 181,000,000 lire. The total number of industrial establishments returned by the census of June 10, 1911, was 243,985, with 2,305,698 employees, and 1,573,774 aggregate horse power. There were 70,914 persons employed in the quarries in 1912; total value of output, 64,258,333 lire. Employed in lime and brick kilns, 106,730 persons; value of output, 189,211,416 lire. The output from the quarries was valued in 1910 at 54,567,420 lire; from lime and brick kilns, at 167,988,073. In the fishing industry, 28,402 boats, with a tonnage of 78,981, were employed Dec. 31, 1911; persons engaged, 127,792; value of total catch in home waters, 24,265,000 lire, of which 4,111,000 lire from the tunny fisheries and 75,320 from coral fisheries. Fisheries products (1909), 3,485,000 lire for tunny, and 22,407,000 for other fish.

COMMERCE. By royal decree dated Aug. 1, 1914, the export of wheat, rye, barley, oats, maize, rice, and flour has been prohibited since that date. Exceptions may, however, be granted to this order. By royal decree dated August 6, the export of the above-mentioned products to Italian colonies has been permitted since August 8. By decree of January 5, no further modification in the prohibition of rice export has been permitted. By decree of Sept. 2, 1915, raw cotton was declared contraband of war. The imports for consumption and export of domestic produce—merchandise, and coin and bullion—are given below for three years (values in lire):

	1909	1911	1913
Imps. mdse. 3,111,710,447	3,889,298,003	3,637,771,000	
" C. & B.*	18,000,800	28,896,500	21,014,000
Total	3,129,711,247	3,418,194,503	3,658,785,000
Exps. mdse. 1,866,889,562	2,204,927,000	2,503,914,000	
" C. & B.*	54,067,700	42,091,900	80,287,000
Total	1,920,957,262	2,247,018,900	2,584,201,000

* Includes all precious metals.

In thousands of lire are given in the table below some details of the special trade for the year 1913:

Imports	1000 lire	Exports	1000 lire
Cereals	488,700	Raw silk	398,000
Coal and coke ...	373,800	Cotton mfrs.	210,200
Raw cotton	336,500	Silk mfrs.	109,900
Machinery	120,000	Fruits	128,200
Timber	139,200	Wines	82,500
Raw silk	178,700	Cheese	73,600
Pig iron	85,100	Dried fruits	54,100
Wool	113,400	Hemp (raw)	71,000
Coffee	44,400	Hides	73,400
Instruments	79,800	Eggs	48,300
Hides	126,000	Sulphur	37,200
Chem. products ..	202,300	Flour	84,030
Iron mfrs.	80,300	Pulp of wheat	34,000
Silk mfrs.	44,800	Yarn, etc.	38,500
Fish	63,700	Automobiles	31,900
Woolens	64,400	Fresh vegetables ..	29,400
Tobacco	44,200	Hats	89,400

Imports	1000 lire	Exports	1000 lire
Cottons	49,200	Rubber mfrs.	50,000
Ships and boats ...	26,300	Wooden wares ...	40,000
Stone	40,100	Chem. products ...	98,300
Wooden wares ...	39,300	Woolens	38,800
Oil seed	38,400	Jute mfrs.	31,300
Copper, etc.	80,200	Meats	28,900
Rubber mfrs.	32,700	Rice	25,700

The export of wines in 1910 was valued at 86,481,113 lire; spirits, 13,361,500; olive oil, 66,600,468; cheese, 58,002,150; eggs and poultry, 40,942,200; almonds, 40,095,565; lemons, 28,412,175. The total transit trade amounted to 77,878,000 lire in 1910, 78,754,000 in 1911, and 84,037,000 in 1912. The more important countries of origin and destination follow, with values in thousands of lire:

Imports	1909	1913	Country	Exports	1909	1913
503,464	612,700	Germany	307,202	343,400		
490,648	571,800	U. K.	187,929	260,500		
390,198	522,700	U. S.	272,374	262,900		
329,106	283,400	France	198,717	281,300		
309,303	264,700	Austria-Hungary	155,087	221,103		
209,600	237,400	Russia	38,597	60,900		
120,901	166,600	Argentina	150,849	183,603		
97,466	146,000	British India *	23,008	44,800		
73,345	77,000	Belgium	38,781	57,800		
80,498	86,800	Switzerland	216,753	249,200		
71,426	34,200	Turkey	79,063	44,800		

* With Ceylon.

In 1910, 142,487 Italian and 13,788 foreign vessels, with an aggregate tonnage of 51,213,901, were entered, and 142,646 Italian and 13,768 foreign vessels (51,177,007 tons) were cleared at Italian ports. The total number of vessels entered at Italian ports in 1911 trade was 173,437, of 56,056,306 tons, of which 159,647 vessels, of 35,924,881 tons, were Italian; cleared, 173,353 of 56,082,448 tons, of which 159,552, of 35,945,206 tons, were Italian. In 1912, 176,603 vessels, of 56,858,021 tons, were entered (162,325, of 35,415,209 tons, Italian), and 176,671, of 56,866,200 tons, were cleared (162,394, of 35,428,871).

The merchant marine included Jan. 1, 1912, 757 steamers, of 696,994 tons, and 4713 sailing, of 410,991 tons; a total of 5470 vessels, of 1,107,985 tons; 1913, 5532 vessels, of 1,137,109 tons (893 steamers, of 762,274 tons).

COMMUNICATIONS. Open for traffic March 1, 1913, were 17,634 kilometers of railway, 13,769 operated by the state. Tramways in operation, 5150 kilometers. Telegraphs June 30, 1913, 53,518 kilometers, with 335,282 kilometers of wires. State telegraph stations, 6356; railway and other, 1952. Marconi stations, 18; on board vessels, 159. Telephone lines, urban, 12,089 kilometers, with 192,838 kilometers of wires; inter-urban, 31,662, with 63,321. Post offices, 11,363.

With the outbreak of war the Italian railways passed under military control as had been arranged in times of peace. The plans worked out provided that during mobilization the railway service should become entirely subject to the military authorities, who regulate the conditions of operation, not only for military transport, but also for ordinary traffic. In accordance with this scheme, immediately on mobilization a "Direction of Transport" was established with full powers in regard to operations and the Director of Transport was placed at the head of a special department attached to the military general staff. The duties of the "Direction of Transport" include repair-

ing and rebuilding lines and bridges, etc., when necessary, for which purpose it has under its control a special military railway engineering organization. The system proved admirably efficient under actual war conditions. The whole of the mobilization was carried out without suspending the ordinary passenger and freight traffic, and the very few cases of temporarily reduced service were determined more for economic than for military reasons. The enormous increase of traffic, in some cases even a hundred-fold, was handled on lines whose facilities were considered inadequate even for normal traffic requirements without a breakdown, and a record of punctuality for the military trains was made.

FINANCE. Revenue and expenditure are given in lire in the table below for three financial years:

	1909-10	1912-13	1913-14
Revenue ..	2,602,163,826	3,252,073,913	2,683,995,971
Expend. ..	2,551,286,013	3,248,789,972	2,648,280,072

Budget totals for 1914-15 follow, in thousands of lire:

Rev.	1000 lire	Expend.	1000 lire
Ordinary	2,530,733	Ordinary	2,284,745
Extraord.	312,811	Extraord.	578,468
Total	2,843,544	Total	2,863,213

Appropriations for the ministries of war and marine were estimated at 380,597,834 and 258,396,528 lire ordinary, and 88,310,513 and 21,320,610 lire extraordinary, respectively.

Capital of the debt June 30, 1915: 9,922,420,633 lire consolidated debt; redeemable, 4,640,247,111; permanent, 64,179,773; tribute, to the Holy See, 64,500,000; treasury obligations, 1,236,370,000; floating debt, 3,062,436,330—total, 18,990,154,847. Assets in the treasury, 182,747,717; leaving actual debt, 18,807,407,130 lire. The interest, including premium, of the total public debt in 1912-13 was 523,084,574 lire, sinking fund, 1,921,047; in 1914-15, 616,777,824 and 6,500,372 lire.

The monetary unit is the lira, par value, 19.295 cents.

ARMY. The army of Italy is organized under the law of July 17, 1910, which provided for the creation of high commands, the organization and increase of the artillery, and the reduction of the auxiliary service. When the war began, in 1914, one-third of all the Italian regiments were in Libya, and the reorganization of the army was still in progress. The artillery was being supplied with new guns, the *aëro* car needed reforming, and serious faults were noted in the territorial forces. Appropriations from Parliament had been inadequate, but when the attention of the government and the people was aroused liberal provision was made, and troops and materials were got ready as rapidly as possible. The minimum number of men in the army was fixed at 1,000,000, and provision was made for increased numbers. In April, 1915, the active forces consisted of 600,000 men, whereas in 1914 there were 14,121 officers and 250,000 men. The territorial militia was increased to 450,000. On May 23rd an order for mobilization was issued, and the first reserve militia up to the year 1883 was called out, and the territorial militia, second reserve, up to the year 1876, including those

under the age of 39. The approximate war strength of the Italian army was about 3,400,000, the accompanying statistics giving an approximation of the available forces:

	Present	Minimum	Maximum
Permanent Army	515,000		734,401
Mobile Militia	245,000		823,170
Territorial Militia	340,000		2,273,631
Total	1,100,000		3,330,202

The military forces were organized into four armies, each of two to four army corps and one cavalry division. The Italian army corps contains two regular divisions, or two and an extra mobile militia division: First case—25,000 men, with 104 guns and 18 machine guns. Second case—37,000 men, with 134 guns and 26 machine guns.

Strength of the first line on the outbreak of the war was estimated at 700,000, consisting of 14 army corps, with 26 Alpine battalions, 38 mobile militia companies, in the second line; and 26 Alpine battalions in the third line. Behind the foregoing were 54 mountain batteries, 6 battalions of carabinieri, and 23 battalions of customs guards with militia formations behind them.

An analysis of the three lines gave the following distribution of the organization:

Battalions of Infantry	824
Squadrons of Cavalry	180
Batteries of field-guns	860
Batteries of fortress artillery	475

The infantry was armed with the Mannlicher-Carcano 6.5 millimeter magazine rifle, pattern 1891, and the cavalry with a carbine of the same calibre and pattern.

For the field artillery one hundred field-batteries with the 75 millimeter rapid-fire Krupp, mostly had been replaced by the *Deport* gun of the same calibre, pattern 1911. Siege guns included 9, 12, 15 centimeter guns and 15 and 21 centimeter howitzers and a new 30 centimeter howitzer was successfully tested at Genoa. There was also a machine gun of a new pattern capable of discharging 1400 shots a minute.

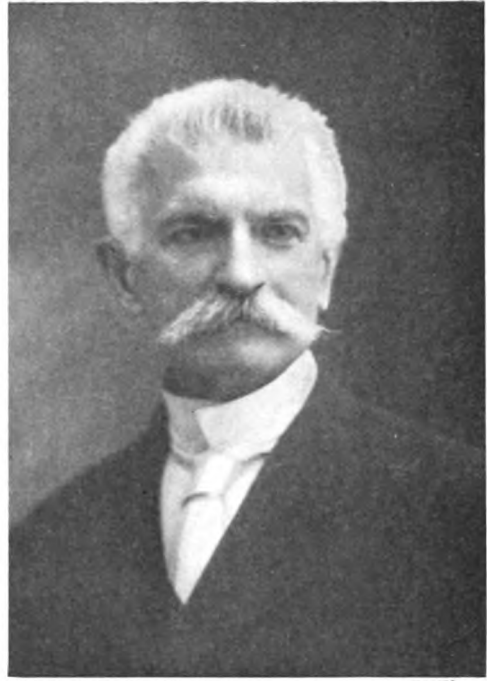
The Italian infantry experienced considerable modification as the result of the war of Tripoli, although the organization remained practically unchanged. An infantry brigade comprises two regiments, each of three battalions of four double companies. The equipment also improved and was excellent, the pack weighing about 30 pounds and including a portion of a shelter tent. As regards the cavalry, each corps had a cavalry division, a regiment of cavalry being composed of five squadrons excellently mounted, with horses supplied for the most part from government operating establishments. Each cavalry division had two battalions of Bersaglieri cyclists, who do no scouting but are intended for dismounted work. See also **MILITARY PROGRESS**, *passim*.

NAVY. The Italian navy classes armored cruisers as battleships. The authorized personnel is 40,063. The programme projected in 1914 contemplated the completion by 1916 of dreadnoughts to make a total of 10 in commission. The *Dante Alighieri* (19,400 tons) was completed in August, 1912, and was the first Italian dreadnought; if her speed (24 knots) is re-



Photograph by Paul Thompson

ANTONIO SALANDRA
Premier and Minister of Interior



Photograph by Paul Thompson

Baron SIDNEY SONNINO
Minister of Foreign Affairs



Prince BERNHARD VON BÜLOW
German Ambassador to Italy



Photograph by Paul Thompson

Count LUIGI CADORNA
Lieutenant General and Chief of Staff

FOUR MEN PROMINENT IN ITALY, 1915

ported correctly, she was at that time the fastest vessel of that type afloat. The *Conte di Cavour*, the *Leonardo da Vinci*, and the *Giulio Cesare* (all dreadnoughts) were completed in 1913. Two others of the same type, the *Andrea Doria* and the *Duilio*, were laid down, one in March, the other in April, 1911. Authorized were two more, the *Morosini* and the *Dandolo*. The cruiser *Quarto* was completed in 1912 and the *Nino Bizio* and the *Marsala* were launched. The new destroyers have a speed of 30 knots; the new torpedo boats 26 knots.

The number and displacement, April 1, 1914, of warships built of 1500 or more tons, and of torpedo craft of 50 tons and over, were as follows: 3 battleships (dreadnought type), having a main battery of all big guns, 11 inches or more in calibre, of 62,644 tons (and 7, of 87,150 tons estimated, building); 8 battleships (pre-dreadnought type), of 96,100; 9 armored cruisers, of 74,020; 6 cruisers, of 18,830 tons (and 2, of 4888 tons, building); 38 torpedo-boat destroyers, of 16,807 tons (and 15, of 14,203 tons, building); 68 torpedo boats, of 11,584 tons (and 2, of 272 tons, building); 19 submarines, of 5475 tons (and 8, of 5842 tons, building)—a total tonnage built of 285,460, and 212,355 building, making a total tonnage built and building of 497,815. Excluded from the foregoing are ships over 20 years old, unless reconstructed and rearmed within 5 years; torpedo craft over 15 years old; transports, colliers, repair ships, torpedo-depot ships, and other auxiliaries. See also NAVAL PROGRESS.

GOVERNMENT. The King (Victor Emmanuel III) is the executive, acting through a responsible council of 11 ministers. The legislative authority is vested conjointly in the King and a Parliament composed of a Senate (318 members) and a Chamber of Deputies (508 members). The King is required to convoke the Parliament annually, but may dissolve it at will. Heir-apparent, Prince Humbert, born Sep. 15, 1904.

HISTORY

DEVELOPMENT OF THE WAR SPIRIT. From the historic parliamentary session of Dec. 3, 1914, in the course of which Premier Salandra had declared his policy of "armed, alert neutrality," to the final rupture between Italy and Austria-Hungary, May 23, 1915, the war spirit in Italy constantly gained in strength. Notwithstanding the protests of Socialists (see SOCIALISM) whose internationalist convictions were opposed to aggressive wars; notwithstanding the pro-Austrian sentiment expressed in certain clerical circles; and in spite of the desire of the Giolitti party for "strict neutrality," the movement for the achievement of "national aspirations" rapidly gathered headway. The diplomatic efforts of Prince von Buelow, Germany's persuasive representative, and the strong influence which German industrial interests in Italy were supposed to exert, proved powerless to stem the current. In January the leaders of the Radical Party removed all doubt as to their position by boldly pronouncing for war in behalf of Italian aspirations. Count della Torre declared that even the clerical faction, which had been suspected of pro-Austrian inclinations, was willing to support intervention in the war, if necessary for the realization of national ideals. At the same time, recurrent reports indicated

that the Italian government was busily preparing the army for the great event.

PARLIAMENT IN FEBRUARY AND MARCH. When Parliament convened, February 18th, intervention was the question of the hour. Republicans, Reformist Socialists, Radicals, and Nationalists with a single voice demanded participation in the war against the Central Powers. In reply to the importunities of Deputy E. Chiesa, February 19th, Premier Salandra refused to commit the government to immediate action, but on February 26th the premier declared: "Italy does not desire war for war's sake, or neutrality at any price, but is ready to make any sacrifice to realize her ambitions." He was warmly supported by the Chamber of Deputies. Bills were introduced in March to authorize rigorous treatment of spies, of contraband dealers, and of persons indiscreetly publishing data regarding Italy's military preparations. The government was empowered to control industries vital to national defense, as well as wireless and aviation establishments. After passing these and other warlike measures, the Chamber adjourned, March 22nd, to the middle of May. The sentiment of the press was meanwhile becoming ever more emphatic in favor of war. On March 7th, to quote but a single instance, the *Giornale d'Italia* declared: "It will be extremely difficult for Italy longer to remain neutral."

THE CRISIS. While the nation was unmistakably preparing for war, the government continued negotiations with Austria-Hungary, with the object of obtaining, if possible, substantial territorial concessions as the price of Italy's non-intervention. Prince von Buelow, the former German Imperial Chancellor, who had been dispatched as Extraordinary Ambassador to the Quirinal in December, 1914, indefatigably labored for the reconciliation of Austria-Hungary and Italy. Popular sentiment in Italy, however, was by this time in so belligerent a mood that even though Austria-Hungary offered to make important concessions, war was insistently demanded. On May 4th Italy denounced the Triple Alliance treaty with Austria-Hungary. On May 5th, Gabriele d'Annunzio, the poet of Italian chauvinism, made a fiery speech in favor of intervention. On May 10th the *Idea Nazionale* declared: "Italy desires war: (1) In order to obtain Trent, Trieste, and Dalmatia. The country desires it. A nation which has the opportunity to free its land should do so as a matter of imperative necessity. . . . (2) . . . in order to conquer for ourselves a good strategic frontier in the North and East. . . . (3) . . . because to-day in the Adriatic, the Balkan Peninsula, the Mediterranean, and Asia, Italy should have all the advantages it is possible for her to have and without which her political, economic, and moral power would diminish in proportion as that of others increased. . . . If we would be a great Power we must accept certain obligations; one of them is war in order to keep us a great Power." Two days later the *Giornale d'Italia* proclaimed that "Italy is determined to realize her national aspirations, cost what it may." As a test of his strength, Premier Salandra offered his resignation, May 14th, but on May 15th, in response to an outburst of warlike enthusiasm, the King requested Signor Salandra to retain the office. The reinstatement of the Salandra cabinet marked the definite failure of ex-Premier Giolitti's opposi-

tion to the war. On May 20th, Premier Salandra asked Parliament to ratify his war policy. In a veritable frenzy of patriotism the Chamber cheered and applauded the premier's declarations. By an overwhelming majority of 407 to 74, only the Socialists and a few of Giolitti's followers opposing, the Chamber voted a bill conferring extraordinary powers on the government and practically authorizing the cabinet to make war. The Senate likewise approved the government's intentions and ratified the bill by an almost unanimous vote, May 21st. War was declared May 23rd, and begun May 24th. The international aspects of this step, and the details of the Austro-Italian negotiations, are discussed in the article on the WAR OF THE NATIONS (q.v.). In this place, however, it may not be amiss to mention the interpretation which the German Imperial Chancellor in his speech of May 28th placed upon the action of Italy. "According to the observation of the best judge of the situation in Italy, in the first days of May four-fifths of the Senate and two-thirds of the Chamber were against war, and in that majority were the most important and responsible statesmen. But common sense had no voice. The mob alone ruled. Under the kindly disposed toleration and with the assistance of the leading statesmen of a cabinet fed with the gold of the Triple Entente, the mob, under the guidance of unscrupulous war instigators, was roused to a frenzy of blood which threatened the King with revolution and all moderate men with murder if they did not join in the war delirium." Premier Salandra, in a speech on June 2nd, replied to the chancellor's insinuations, and retaliated by vehemently denouncing the endeavors of Prince von Buelow to bribe Italy to keep the peace.

WAR AGAINST TURKEY. Although the Hodeida incident (consult the YEAR BOOK for 1914, p. 711) had been settled in January, 1915, relations between Italy and Turkey were strained to the breaking point in August, 1915. The Italian declaration of war against Turkey, August 21st, was prefaced by indignant representations to the Porte in respect of Italian nationals, whom, it was alleged, the Turkish authorities had detained in Turkish ports.

CABINET CHANGE. Toward the end of September Vice-Admiral Leone Viale resigned his post in the cabinet as minister of marine, and was succeeded by Vice-Admiral Camillo Corci.

THE CABINET SUPPORTED. In December, after six months of fighting, in which Italy had failed to conquer even the territory which Austria-Hungary had offered to cede, the Parliament still unwaveringly supported the Italian government in prosecuting the war, in fulfillment of the pledge which Italy had given, promising solidarity with the Entente (consult WAR OF THE NATIONS). On December 4th Premier Salandra in a speech before the Chamber of Deputies, reiterated his assurances of ultimate victory, and hinted that certain journals hostile to the government would be suppressed. The Chamber of Deputies thereupon passed a vote of confidence, and a few days later conferred full financial powers upon the government for the next six months. A minority of about 50 deputies opposed the ministry.

OTHER EVENTS. Consult also articles on ALBANIA; EARTHQUAKES; ROMAN CATHOLIC

CHURCH; SOCIALISM; UNITED STATES AND THE WAR; WAR OF THE NATIONS, *passim*.

IVINS, WILLIAM MILLS. American lawyer, died July 23, 1915. He was born in Freehold, N. J., in 1851, and received an academic education in Brooklyn. He studied law at Columbia Law School, graduating in 1873, and was admitted to the bar in the same year, beginning the practice of law in Brooklyn as a member of the firm of Bergen & Ivins. At the same time he began to take an active interest in politics, joining the movement headed by General Slocum against the "Brooklyn Ring." This fight was directed against Hugh McLaughlin, then the undisputed boss of the Brooklyn Democratic organization, and it was so successful that it drove McLaughlin into retirement for three years. In 1881, Mr. Ivins became private secretary to Mayor William R. Grace. He joined the County Democracy and was active in opposition to Tammany Hall until the election of Mayor Edson. In 1882 he was appointed a school commissioner of the city and served until 1885. He devoted himself to the study of industrial education. He was chamberlain of New York City for two terms, returning thereafter to the practice of law. In 1891 he was counsel for the Senate Investigating Committee which was appointed to examine into the government of New York City. His cross examination of Richard Croker during this proceeding revealed him as one of the most brilliant cross-examiners ever produced by the bar, and his elaborate report of the work of the committee established his reputation as an expert in municipal affairs. In 1892-93 he was counsel to the Brazilian government in a contest with the Argentine government over the Misiones territory, a matter which was finally arbitrated by President Cleveland and decided in favor of Brazil. Mr. Ivins was largely interested in the growing and marketing of rubber in South America and became president of the General Rubber Company. In 1905 he accepted the Republican nomination for mayor of New York City, being defeated by the Democratic nominee, George B. McClellan. Four years later he managed the mayoralty campaign of William R. Hearst in the three-cornered contest between William J. Gaynor, Otto T. Bannard, and Mr. Hearst. Mr. Ivins, after leaving the County Democracy in the earlier years of his political career, became an enrolled Republican, but he was notably independent, and did not always vote for Republican nominees. He was brought prominently before the public in 1915 as counsel for William Barnes in the latter's suit for libel against Theodore Roosevelt, his cross-examination of Mr. Roosevelt and other witnesses attracting wide attention. His efforts previous to and during this trial were so trying that they resulted in a physical collapse which ended in his death. While Mr. Ivins's fame was gained as a lawyer, he was a student of literature and of modern languages, a collector of art objects, a brilliant orator, and a keen, capable man of business. He began to write a history of diplomacy, but was obliged to lay aside the work. He spoke fluently many modern languages, and was especially fond of reading Greek poets in the original. His collection of Napoleon medals forms a complete medallic history of Napoleon. He acquired many rare books, among them four folios of Shakespeare. He was one of the founders of the

State Bar Association, and took a leading part in organizing the Reform Club, which aided the cause of tariff reform, and the Commonwealth Club, which agitated for ballot reform.

IVORY COAST. One of the colonies composing the government-general of French West Africa. The capital is Bingerville, with 78 European and 780 native inhabitants. Other centres are: Grand-Bassam, 164 European and 2832 native inhabitants; Abidjan, 110 and 613; Lahou, 78 and 3050; Tiassalé, 17 and 1548; Aboisso, 38 and 1241; Assinie, 38 and 1135. The principal products for export are mahogany and other woods, palm kernels and oil, rubber, manioc, and ground nuts. Neither the climate nor the vegetation is conducive to the development of the grazing industry. The railways under construction are destined to put into communication with the coast, by way of the equatorial forests, the regions of Bouaké, Kong, and Koroko. The main line in operation starts at Abidjan, on Lagoon Ebrié, and extends through Dimbokro on the N'Zi, an affluent of the Bandama, as far as Bouaké, a distance of 316 kilometers (196 miles). The line will ultimately reach the frontier. See FRENCH WEST AFRICA.

I. W. W. See INDUSTRIAL WORKERS OF THE WORLD.

JAMAICA. The largest of the British West Indies; a crown colony, with dependencies as follows: Turks and Caicos Islands, Cayman Islands, Morant Cays, and Pedro Cays. Area of Jamaica, 4207 square miles. Population, 831,383 (15,605 white, 163,201 colored, 630,181 black, 22,396 East Indian). Kingston (57,379 inhabitants in 1911) is the capital and has a fine harbor. Available for cultivation, 2,612,480 acres; returned as under crops in 1912-13, 922,633 (tilled lands, 267,276 acres; guinea grass, 152,527; commons, 502,830). Area under sugar cane (1913), 31,160 acres; under coffee, 20,023; under bananas, 85,468. Imports (1913), £2,837,446; exports, £2,430,207 (bananas, £988,236; sugar, £52,171; coffee, £158,578; rum, £101,328; dyewoods, £113,839; pimento, £88,148; cacao, £114,738; ginger, £36,373; oranges, £58,967). Railway, 197 miles. Revenue (1913-14), £1,267,543; expenditure, £1,276,250. Debt (March 31, 1914), £3,810,447.

In May, word was sent to Gen. Sir H. W. Manning, Governor of Jamaica, that the Imperial government had decided to accept the offer of the colony to furnish a war contingent for duty at the front. By July, subscriptions in the colony to various war funds had amounted to £20,000. The Legislative Council also granted £50,000 to pay for a gift of sugar to the mother country.

JAPAN. An empire of the Far East, composed of four large and many small islands, together with Korea (q.v.), Formosa (q.v.), the southern part of Sakhalin, and the leasehold of Kwantung (q.v.). The capital is Tokyo.

AREA AND POPULATION. The following table shows the principal islands and the number of adjacent islands composing Japan proper, their area in square miles, and the total legal population on Dec. 31, 1908:

Islands	No.		Square miles			Pop. 1908
	Adj.	Is.	Adj.	Total		
Honshiu	167	86,305	470	86,775	37,041,187	
Shikoku	75	6,856	175	7,031	3,288,310	
Kiushiu	150	13,768	1,820	15,588	7,167,148	
Hokkaido	13	80,144	162	80,276	1,184,002	

Islands	No.		Square miles		Pop. 1908
	Adj.	Is.	Adj.	Total	
Chishima*	...	6,024	...	6,024	8,458
Sado	...	385	...	385	120,510
Oki	1	130	...	180	88,349
Awaji	1	218	1	219	210,646
Iki	1	51	...	51	40,522
Tsushima	5	262	4	266	39,264
Riukiu†	...	934	...	934	501,815
Ogasawarajima‡ ..	...	27	...	27	8,595
Total	413	145,024	2,633	.....	49,588,804

* 31 islands.

† 55 islands.

‡ 20 islands, not including the volcanic Iwojima.

The resident population Dec. 31, 1908, numbered 51,742,486 (as compared with 45,403,041 at the end of 1898). The reported resident population at the end of 1914 was 53,696,884; the population of the dependencies was calculated at 19,687,666, making a total of 73,384,550. The area and estimated population of the dependencies are as follows: Chosen (Korea), 84,106 square miles, 15,508,872 inhabitants; Taiwan (Formosa), 13,841 and 3,612,184; Karafuto (Japanese Sakhalin), 13,155 and 49,463; Kwantung (Kwanto), 1221 and 517,147; Hokoto (Pescadores), 48 square miles; total, 111,150 square miles, 19,687,666 inhabitants. The reported number of Japanese resident abroad at the end of 1913 was 334,950, of whom 77,736 (66,879 males, 10,857 females) in the United States. The number of foreigners in Japan at the end of 1911 is reported at 15,221, of whom 8190 were Chinese, 2673 British, 1794 Americans, 837 Germans, and 543 French.

The number of marriages in 1910 was 442,498, and the annual average for 1901-10, 402,469; divorces, 59,681; living births, 1,726,522 and 1,553,754; still births, 157,392 and 154,645; deaths, 1,073,732 and 1,006,646; marriage rate, 8.74 and 8.37; divorce rate, 1.18 and 1.30; living birth rate, 33.9 and 32.2; of living births, the number of boys per 100 girls, 103.9 and 104.65; percentage of still births, 3.35 and 9.06; death rate, 21.1 and 20.9.

Resident population of the larger cities as calculated for Dec. 31, 1911: Tokyo, 2,099,200; Osaka, 1,387,400; Kyoto, 508,100; Nagoya, 448,000; Kobe, 440,800; Yokohama, 396,100; Nagasaki, 160,500; Hiroshima, 159,600; Kanazawa, 127,300.

EDUCATION. Japan has a highly efficient educational system. Primary instruction is compulsory. Public primary schools in 1913 numbered 25,673, with 158,601 teachers (115,187 male, 43,414 female) and 7,037,430 pupils (3,767,665 male, 3,269,765 female). Secondary schools for boys numbered 315, with 6220 teachers and 128,973 students; superior schools for girls, 299, with 3818 teachers (of whom 1646 male) and 75,128 students; normal schools, 86, with 1619 teachers and 27,653 students (of whom 19,007 male); superior normal schools, 4, with 223 teachers and 1750 students (of whom 1091 male). Medical schools in 1913, 16, with 6600 students (of whom 242 female); theological schools, 23, with 1744 students (of whom 27 female); schools of political science, law, etc., 749, with 15,821 students (all male); special schools of letters, 12, with 1758 students (of whom 526 female); lycées, 8, with 358 teachers and 6537 students. In addition, there are technical and special schools and 4 universities. The universities are the Imperial University of Tokyo

(with 5094 students), the Imperial University of Kyoto (1474), the Imperial University of the Northeast (1891), and the Imperial University of Kiushiu (487); total number of university students, 8946; teachers, 792.

AGRICULTURE. Of the arable land, about three-fifths is cultivated by peasant proprietors, and the remainder by tenants. The taxed land owned by private persons and local corporations Jan. 1, 1914, was reported at 14,839,426 cho (1 cho = 2.4507 acres, or 0.99174 hectares), of which 5,266,094 were under cultivation, 7,827,987 under forest, and 1,285,411 open field.

For some of the principal crops, the area in hectares and the yield in metric quintals are shown in the following table for 1913-14 and 1914-15, together with the yield per hectare in 1913-14 (the figures for 1914-15 are preliminary):

	Hectares		Quintals		Qs.
	1913-14	1914-15	1913-14	1914-15	ha.
Rice	8,008,818	8,060,510	103,088,637	100,728,426	84.8
Wheat	475,979	475,045	5,890,814	6,441,750	12.4
Barley	1,383,110	1,298,075	19,891,264	21,230,398	14.9
Corn	57,100	58,804	953,816	952,288	16.7
Oats	50,323	65,662	844,790	.....	16.8
Potatoes	75,700	78,662	6,804,374	6,825,000	89.9
Tobacco	35,900	31,000	525,000	480,000	14.6

Live stock at the end of 1912 and 1913, respectively: horses, 1,581,743 and 1,582,125; cattle, 1,399,498 and 1,388,708; sheep, 3308 and 2946; goats, 101,475 and 89,488; swine, 308,970 and 309,905.

OTHER INDUSTRIES. Value of mineral and metal products in 1912, in yen: coal, 61,412,837 (tons, 19,639,755); copper, 40,252,061; petroleum, 8,377,073; gold, 6,799,072; silver, 5,986,084; iron, 2,304,614; sulphur, 1,372,824; steel, 745,795; lead, 531,282.

The total fisheries products were valued in 1912 at 137,984,518 yen, as compared with 124,578,815 yen in 1911, and 116,792,553 in 1910.

On June 14, 1914, there were 42 cotton-spinning companies, with 2,402,573 spindles; consumption, 398,729,214 pounds of cotton; production, 345,738,547 pounds of yarn. Cotton-weaving companies numbered 17, with 24,100 looms; production, 227,902,240 pounds. Other important manufactures are paper, matches, earthenware, lacquered ware, matting, and leather.

COMMERCE. The following table shows the value in thousands of yen of total imports and exports, distinguishing merchandise from coin and bullion:

	1911	1912	1913	1914
Imports mdse.	513,806	618,992	729,432	575,470
Imports C. & B.	6,168	11,544	1,021	9,107
Total	519,974	630,537	730,453	584,577
Exports mdse.	447,437	526,982	632,460	572,706
Exports C. & B.	24,398	28,325	27,093	29,650
Total	471,832	555,307	659,554	602,356

Total imports of merchandise in 1912 and 1913, respectively, 618,992,277 and 729,431,644 yen; exports, 526,981,842 and 632,460,213. Of these totals for merchandise, 618,160,786 yen in 1912 and 728,626,129 yen in 1913 represented imports of foreign produce, and 831,491 yen in 1912 and 805,515 yen in 1913 represented re-imports of Japanese produce; 524,614,911 yen in 1912 and 629,526,250 yen in 1913 represented

exports of Japanese produce, and 2,366,921 yen in 1912 and 2,933,963 yen in 1913 were re-exports.

The principal articles of trade, with their values in thousands of yen (excluding reimport and reexport values), are as follows:

Imports	1911	1912	1913	1914
Rice	17,721	30,192	48,472	24,824
Wheat	3,729	4,401	12,351	8,489
Wheat flour	1,708	1,722	1,782	1,266
Soya beans	10,306	10,222	10,392	18,307
Sugar	9,157	16,047	36,802	21,698
Raw cotton	145,455	200,824	223,599	218,975
Cotton shirtings and prints	8,058	3,262	2,720	1,004
Cotton satins	1,904	3,119	3,434	2,054
Wool	11,268	16,334	15,998	14,784
Woolen yarn	4,788	8,225	10,087	4,111
Woolen cloth	10,656	6,911	10,498	9,067
Oil cake	29,362	27,480	39,499	34,860
Petroleum	18,065	12,438	11,102	8,657

	1911	1912	1913	1914
Iron bars, rods, and plates	5,378	35,600	32,817	24,745
Engines and rolling stock	2,225	2,563	4,461	1,957
Machinery	.....	28,289	34,426	24,147

Exports:	1911	1912	1913	1914
Cotton yarn	40,213	53,681	70,998	78,555
Cotton shirtings	7,382	25,760	33,612	34,844
Raw silk	128,875	150,325	188,929	161,797
Silk waste	7,786	10,546	10,471	4,673
Silk mfrs.	30,686	26,832	34,882	30,894
Coal	17,990	20,324	23,671	23,962
Matches	10,073	12,044	11,865	11,052
Copper	20,008	24,921	28,184	27,197
Camphor	8,148	2,827	2,236	2,760
Tea	14,379	18,467	10,077	12,718
Rice	3,941	4,388	4,375	4,974
Matting	8,746	8,758	4,054	2,814
Earthenware	5,378	5,452	6,689	5,914
Straw-plait	4,717	17,838	15,692	14,855
Sake	2,135	2,223	2,198	2,112
Refined sugar	1,835	8,477	15,831	12,888
Toys	.....	1,898	2,490	2,592

Imports and exports of merchandise by principal countries were valued as follows in 1912 and 1913, in thousands of yen:

	Imports		Exports	
	1912	1913	1912	1913
U. Kingdom	116,147	122,737	29,792	32,870
France	5,421	5,829	43,871	66,230
Germany	61,076	68,395	18,488	13,132
Other Europe	20,665	23,229	27,162	40,497
China	54,807	61,223	114,824	154,660
Kwantung	25,707	30,878	27,545	29,836
Hongkong	882	1,195	28,713	33,622
Fr. Indo-China	10,644	24,700	849	1,055
Du. E. Indies	19,063	37,389	4,343	5,149
Br. India	134,742	173,174	23,648	29,878
Other Asia	14,193	19,396	19,305	21,732
United States	127,016	122,408	168,709	184,475
Other	28,629	38,679	25,238	25,835
Total	618,992	729,432	526,982	632,460

SHIPPING. There were entered at the ports in 1913 in the over-sea trade 10,242 vessels, of 24,720,415 tons; of these, Japanese, 6576 vessels, of 12,576,467 tons; British, 2172, of 7,338,390 tons; German, 469, of 1,683,800 tons; American, 182, of 1,330,594 tons; other, 845, of 1,

891,164 tons. Japanese shipping in the foreign trade receives government subsidy. Merchant marine, Jan. 1, 1914: vessels of European construction, 2072 steamers, of 1,528,264 tons, and 7343 sail, 571,872 tons; sailing craft of Japanese construction, 20,635.

COMMUNICATIONS. The reported length of railway (including the railway of Korea and Formosa) in operation March 31, 1913, was 10,986 kilometers, of which 7837 kilometers state and 3149 kilometers private. Electric tramway, 1098 kilometers.

The final plans for the construction of the government railway line from Tokyo to Kōtō, cutting off the haul over the Hakone Mountains by boring a tunnel through the mountains near Atomi, were adopted during 1914. It was proposed to use electric power for hauling through the tunnel. During the year 1914 the Imperial Japanese government opened 175 miles of new sections of railway. The 1914 extension included 25 miles on the Tokushima line, 23 on the Sakata line, and 20 miles each on the Murakami and Gwanyetsu lines. The new central station in Tokyo was completed in 1914, and a government electric railway was opened between Tokyo and Yokohama. This parallels the existing steam track and is 19 miles in length, with 14 intermediate stations. Soon after this railway was opened in 1914, for a few days at the end of the year, it was necessary to discontinue the service, as trouble developed with the overhead equipment.

A general plan of railway construction was adopted in 1915. This contemplated the completion of the railway system for the country within 10 years, and the addition of 1219 miles to the mileage already operated. During the fiscal year new lines of 79 miles were to be completed and opened to traffic. Within the succeeding six years 238 miles were to be completed. Lack of capital prevented the announcement of a programme for the remaining construction. All the light railway lines, with a total length of 331 miles, were to be postponed until the year 1916-17, or later.

Telegraphs (1913), 4478 offices, with 40,379 kilometers of line and 179,295 kilometers of wire. Radiotelegraphic stations, 31, and stations on board ship, 20. Post offices (1914), 7983.

FINANCE. The standard of value is gold; the monetary unit is the yen, having a par value of 49.846 cents. In 1911-12, revenue and expenditure amounted to 657,192,221 and 585,374,613 yen, respectively; in 1912-13, 687,302,484 and 593,596,445. For 1914-15, revenue was estimated at 654,282,173 yen, and expenditure at 559,759,598 yen; for 1915-16, estimated revenue and expenditure balanced at 556,396,000 yen. In the 1914-15 budget, ordinary revenue was placed at 534,065,202 yen, and extraordinary at 120,216,971; ordinary expenditure, 414,682,071, and extraordinary, 145,077,527. The larger items of estimated ordinary revenue for 1914-15 were: public undertakings and state property, 133,671,011 yen; liquor tax, 91,030,740; land tax, 75,120,976; posts and telegraphs, 60,824,265; customs, 57,863,480; monopolies, 54,151,634; income tax, 31,296,279; stamps, 30,531,533; business tax, 26,433,398. The larger estimated disbursements for 1914-15 were, by departments: finance, 188,463,862 yen (including interest on the debt); army, 75,542,228; communications,

61,644,342; navy, 40,887,512. Public debt, March 31, 1913, 2,493,969,745 yen; March 31, 1914, 2,545,070,505, of which 1,054,633,854 internal and 1,490,436,651 foreign.

ARMY. In 1915 the army of Japan was making further progress towards organization established by the law of 1907, which contemplated an army of 1,637,000 trained men, of whom 742,000 were in the standing army, 780,000 in the reserve, and 115,000 in the last reserve. Each year 450,000 men reach military age, but the annual recruit list amounts to only 130,000, and the training commences December 1st. Every male subject between the ages of 17 and 40 is liable for service, and the recruit contingent is obtained by general conscription. In the army the length of service is two years for the infantry, and three years for the other branches, while in the navy it is four years. Service in the first line reserve is four years for the army, and three years for the navy; in the second line, ten years for the army, and five years for the navy. There are also first and second levies on the last reserves consisting of those who have passed out of the reserves and those who have been excused from service. Non-commissioned officers are selected from privates who show the requisite capacity, while the officers come from military academies and from civil life, on a basis of family standing and competitive examination. Those failing to reach a certain grade by a certain age come to the inactive list, so that a young corps of officers is provided, while a corps of reserve officers is maintained.

The army consists of 1 guard and 18 line divisions, the former being recruited from the whole country, while the 18 line divisions, of which the 9th and a special brigade are in Korea, and the 5th and a brigade for a railway guard are in Manchuria, come from districts, each district for recruiting and mobilization purposes furnishing a division. A division is composed of 2 infantry brigades, each brigade of 2 regiments of 3 battalions of 4 companies, and of a machine gun section with six guns each. A division has a cavalry regiment of 3 squadrons, 1 regiment of field artillery, and six 6-inch batteries, 1 three-company battalion of engineers, and 2 companies in the train. The guard, 1st, 8th, and 15th divisions possess about twice the cavalry and artillery strength of the others.

The total strength of the Japanese army in organization consists of 248 battalions of infantry, 89 squadrons of cavalry, 152 field batteries, 9 mountain batteries, 57 heavy artillery batteries, and 57 engineer companies, 12 railway companies, 6 telegraph companies, 1 aëro battalion, and 36 companies of train troops. On a war strength each division possesses 12,000 rifles, 450 sabres, 36 field pieces, and 24 machine guns. The arm of the infantry is the Arisaka rifle, model of 1905, calibre 65 mm.

The Budget Committee of the Japanese Diet approved during the year a measure providing for an addition of two divisions, about 24,000 men, to the Japanese army.

NAVY. The number and displacement of warships of 1500 or more tons, and of torpedo craft of 50 or more tons, built and building, on July 1, 1914, are reported as follows: Dreadnoughts: built, 2, of 41,600 tons; building, 4, of 122,400 tons. Predreadnoughts: built, 13; building, none. Coast defense vessels: built, 2, of 9086

tons; building, none. Battle cruisers: built, 2, of 55,000 tons; building, 2, of 55,000 tons. Armored cruisers: built, 13, of 138,483 tons; building, none. Cruisers: built, 13, of 57,915 tons; building, none. Torpedo-boat destroyers: built, 50, of 20,487 tons; building, 2, of 1676 tons. Torpedo boats: built, 27, of 3017 tons; building, none. Submarines: built, 13, of 2672 tons; building, 2, of 1200 tons. Total tonnage built, 519,640; building, 180,276. Excluded from the foregoing are: ships over 20 years old from date of launch unless reconstructed and rearmed within five years; torpedo craft over 15 years old; transports, colliers, repair ships, torpedo-depot ships, and other auxiliaries; vessels not actually begun or ordered, although authorized. On July 1, 1914, Japan was fifth among the nations in the amount of warship tonnage both built and building. See also NAVAL PROGRESS.

GOVERNMENT. The executive authority is the Emperor, acting through a cabinet of ministers whom he appoints and who are responsible to him. The legislative power is vested in a parliament, or imperial diet, consisting of two chambers—a house of peers having 366 members, and a house of representatives having 379 members elected for four years. The Emperor is Yoshihito, born at Kyoto, Aug. 31, 1879, and succeeded his father, Mutsuhito, July 30, 1912. The accession ceremony took place Nov. 10, 1915. Yoshihito married Princess Sadako, May 10, 1900. Heir apparent, Prince Hirohito, born April 29, 1901.

HISTORY

ELECTIONS. After the dissolution, Dec. 25, 1914, of the intractable House of Representatives, which had refused to ratify an increase of two divisions in the army, elections were called for March 25, 1915. Although there was evidence of a strong current of popular opinion against the bureaucratic methods and against the military proposals of the government, nevertheless the ministerial party was returned victorious with a majority of some 80 seats in the new House of Representatives. If the statements of disappointed opponents of the government may be accepted as trustworthy, the ministerial victory was due to the use of corruption (*infra*) and the unjustifiable exercise of governmental pressure upon the electorate, as well as to the fact that under the very restricted franchise, which excluded the poorer classes from the suffrage, popular opinion was not adequately or faithfully expressed.

VICTORY FOR NATIONAL DEFENSE. The most obvious result of the elections was the approval of the government's plans for national defense, which had been vetoed by the defunct House of Representatives but could now be adopted. The army increase was passed, June 1st, without serious opposition from the anti-militaristic minority, by a vote of 232 to 131. The chief feature of the military programme was the creation of two new army divisions for Korea. The regular naval appropriations were approved at the same time.

CRITICISM OF CHINO-JAPANESE NEGOTIATIONS. If the Opposition could not defeat the military proposals of the government, it could at least voice its disapproval of the manner in which the negotiations for special privileges in China were conducted (consult CHINA). In attacking Count Okuma's Chinese policy the anti-militarists of

the Opposition who considered Japan's demands quite unjustifiable could count also upon the support of the extreme chauvinists who complained that the Japanese government was allowing itself to be hoodwinked by the dilatory tactics of Chinese diplomacy. With characteristic political shrewdness, Count Okuma, by presenting an ultimatum to the Chinese government, May 7th, forced China to accept most of the Japanese demands, May 9th, about a week before the Japanese Diet was convened, so that the Diet could have no opportunity of interfering with the negotiations, but only the thankless task of criticising a *fait accompli*. The newly elected House of Representatives met for the first time on May 17th, and elected as its president, Saburo Shimada, who, by the way, was a conspicuous opponent of a large Japanese navy, on the ground that Japanese naval aggrandizement might antagonize the United States. The Diet was formally opened by the Emperor, May 20th. Before passing to the consideration of the Chinese question, the Diet briefly discussed the California land question. Baron Kato, minister of foreign affairs, explained that the Government of the United States was cordially disposed towards Japan, and that the Japanese government expected an amicable settlement of the California land dispute. The California question having been debated, and the military programme approved (*supra*), the Diet proceeded with the criticism of Count Okuma's dealings with China. On June 2nd an Opposition speaker introduced a resolution in the House of Representatives voicing the opinion that the attempt of Japan to gain a privileged position in China had been a complete fiasco. Instead of working to establish a firm foundation for peace in the Orient, the Japanese government had caused bitterness between China and Japan and had aroused the suspicions of foreign powers. Furthermore, the concessions granted by China (see CHINA) were likely to furnish occasion for future complications, instead of forming the basis of friendly relationships. The debate on the resolution gave rise to a heated altercation on the floor of the House. Deputies K. Hara, M. Inukai, and H. Ogawa violently denounced the government. Among the most interesting statements was the assertion made by antagonists of the government that Group V, containing the most important demands on China, had been dropped by Japan as a result of diplomatic intervention by the Powers. Baron Kato, the foreign minister, repudiated the insinuation, and declared that Japan had modified her demands as a proof of her conciliatory and pacific intentions. After two days' excited debate, the Chamber rejected the condemnatory resolution, June 3rd.

THE CABINET CRISIS. Unable to defeat the government on the question of the Chinese negotiations, the Opposition resorted to an attack upon the honor of the cabinet. On June 5th the Opposition proposed a resolution expressing lack of confidence in Viscount Kanetake Oura, minister of the interior, on the ground that he had given bribes in an effort to purchase votes in favor of the Army Bill. Again, on June 7th, the Opposition introduced a resolution declaring lack of confidence in the entire cabinet on the ground that the ministry had interfered in the last election. Viscount Oura denied the charge that he had attempted to corrupt members of



COUNT OKUMA, JAPANESE PRIME MINISTER, IN CORONATION ROBES



Photographs by Paul Thompson

**SHINTO PRIESTS WATCHING THE CORONATION PROCESSION
CORONATION OF THE MIKADO OF JAPAN**

the Diet, but following an investigation made by the ministry of justice, he suddenly resigned his portfolio of the interior. Viscount Oura's sudden resignation, coupled with the arrest of K. Hayashida, chief secretary of the House, who admitted having received bribes for distribution to Opposition members, caused a tremendous sensation and an outburst of popular indignation against the government. Count Okuma, assuming responsibility for the actions of his subordinates in the cabinet, tendered the resignation of the ministry on July 30th. While the Opposition demanded the installation of ex-Premier Saionji as the head of a new cabinet, and other adversaries of Count Okuma proposed Baron Goto for the position, the Elder Statesmen advised the Emperor, and Tokyo business-men seconded the advice, that Count Okuma be retained as premier. The Emperor therefore requested Count Okuma to reconsider his resignation, and on August 5th the latter reconstituted his cabinet as follows: Premier and minister of foreign affairs, Count Saionji; Okuma, minister of finance; Tokutomi, minister of marine; Vice-Admiral Yamamoto; Kato, minister of war; Lieutenant Ishikawa; Oka, minister of justice; Yano, Count, minister of communications; Katsunobu Minoura, minister of commerce and agriculture; Haraoka Kono, minister of education; S. Takata, minister of interior. Kitakura Ikuo. Four days later Baron Kikuchi Ischi, ambassador to France, accepted the portfolio of foreign affairs in the new Okuma cabinet. It is noticeable that the foreign minister and the finance minister, who had been most severely censured by the Diet, were eliminated from the reconstituted cabinet. Late in September a joint military-political investigation found K. Hayashida, the secretary of the House of Representatives, guilty of bribery in connection with the attempt to secure support for the Army Bill by corrupt methods. Seventeen members and former members of the House were likewise found guilty of corruption. The sums given to Secretary Hayashida by ex-Minister Oura and distributed as bribes amounted in all to about 400,000 yen (\$2,000,000).

JAPAN AND THE EUROPEAN WAR. Japan's activities throughout 1914 with regard to the European war had been mainly confined to the capture of German colonies and the imprisonment of German and Austrian sailors and soldiers. Early in January, 1915, a device was manufactured in the French press that Japan intended to send troops to the western battle front. Prominent among those who attacked this notion were W. Pomeroy and M. Clemenceau. The proposition was discredited in Great Britain on the ground that Japanese would soon be able to send another British army to the Continent, and the Japanese would not be needed. Furthermore, French Britain knew that Japan was likely to ask for financial assistance and freedom of action in China in return for her military aid, and British statesmen questioned whether the assistance given Japan might offer value in view of the great capital, however, that came through of sending an army into France in Germany. Britain knew that even if through affairs that late in January 1915, a position which should not be lightly compromised, as it had in the past bearing in other European national interests in the peace of the Far East and a further want seriously affect Japan's business. Japan

Kato realized, however, that Japan would not be immune, if Germany were successful; therefore, he maintained that the country must be in readiness to send troops to Europe if it became necessary in order to ensure the success of the Allies. With the Chinese situation finally cleared up, Japan, in July, decided to offer aid to the Allies in the form of war munitions. Japanese forts in Manchuria were stripped of their great guns; boots, explosives, ammunition, and gun cases were manufactured in great quantities and shipped across Russia to the western front. New munitions factories were constructed in many parts of Japan, turning out great quantities of war supplies, for which France and Great Britain pledged payment. In August, the announcement was made that since the beginning of the war Japan had lost 1350 men in killed and wounded. Late in October, the Japanese government announced that in accordance with a request which had been received ten days earlier, Japan had given her adhesion, October 18th, to the Pact of London, binding herself, as the other Entente Allies had already done, not to conclude a separate treaty of peace with the Central Powers.

For Japanese relations with the United States, consult UNITED STATES, *Foreign Relations*; for relations with China, consult CHINA.

JAPANESE POWDER. See ANTISEPTICS.

JAVA. See INDONESIAN ISLANDS.

JEWISH AGRICULTURAL AND INDUSTRIAL AID SOCIETY. See AGRICULTURAL CREDIT.

JEWS AND JUDAISM. It is still impossible to give reliable and up-to-date statistics of the world's Jewish population. The most recent and authoritative estimate that of *The American Jewish Year Book* for 1913-14, reckons the total Jewish population of the world as 11,277,542, distributed as follows: Africa, 411,250; America, 2,500,000; Asia, 254,477; Australia, 11,471; and Europe, 8,009,345. By countries, the same estimate shows 55,000 Jews in Argentine Republic; 17,287 in Australia; 2,204,502 in Austria-Hungary; 15,000 in Belgium; 7,406 in Bulgaria; 71,401 in Canada; 100,000 in France; 4,100 in Germany; 4,25 in Greece; 41,029 in Italy; 200,475 in Romania; 4,000 in the Russian Empire; 17,297 in Serbia; 8,000 in Spain; 11,027 in Switzerland; 100,000 in Turkey; 147,000 in the United Kingdom; and 2,143,704 in the United States. Most of these figures, however, fall considerably below the actual present populations in the respective countries. For instance, Russia at the close of 1913 is estimated to have had approximately 7,000,000 Jewish inhabitants, the United States 1,000,000, Canada 1,000,000, and Serbia 450,000. But the war is creating a large "floating" Jewish population in the various war-torn countries, particularly including the most eastern estimates. Likewise, immigration estimates for the non-belligerent countries during an extraordinary immigration in normal times are not at all too high, just as the extent that they are reckoned upon the normal tide of immigration when the war has ended.

WORLDWIDE EFFECTS. With some 11,000,000 Jews of a nation Jews more arms and more than three-fourths of the world's Jewish population living in the war zone, all accounts of Jewish life and progress during 1915 must will be written in terms of the great world-conflict.

the Diet, but following an investigation made by the ministry of justice, he suddenly resigned his portfolio of the interior. Viscount Oura's sudden resignation, coupled with the arrest of K. Hayashida, chief secretary of the House, who admitted having received bribes for distribution to Opposition members, caused a tremendous sensation and an outburst of popular indignation against the government. Count Okuma, assuming responsibility for the actions of his subordinates in the cabinet, tendered the resignation of the ministry on July 30th. While the Opposition demanded the installation of ex-Premier Saionji as the head of a new cabinet, and other adversaries of Count Okuma proposed Baron Goto for the position, the Elder Statesmen advised the Emperor, and Tokyo business-men seconded the advice, that Count Okuma be retained as premier. The Emperor therefore requested Count Okuma to reconsider his resignation, and on August 8th the latter reconstructed his cabinet as follows: Premier and minister of foreign affairs, Count Shigenobu Okuma; minister of finance, Tokitoshi Taketomi; minister of marine, Vice-Admiral Tomasaburo Kato; minister of war, Lieut.-Gen. Ichinosuke Oka; minister of justice, Yukio Ozaki; minister of communications, Katsundo Minoura; minister of commerce and agriculture, Hironaka Kono; minister of education, S. Takata; minister of interior, Kikura Ichiki. Four days later Baron Kikujiro Ishii, ambassador to France, accepted the portfolio of foreign affairs in the new Okuma cabinet. It is noticeable that the foreign minister and the finance minister, who had been most severely censured by the Diet, were eliminated from the reconstructed cabinet. Late in September a preliminary judicial investigation found K. Hayashida, the secretary of the House of Representatives, guilty of bribery in connection with the attempt to secure support for the Army Bill by corrupt methods. Seventeen members and former members of the House were likewise found guilty of corruption. The sums given to Secretary Hayashida by ex-Minister Oura and distributed as bribes amounted in all to about 40,000 yen (\$20,000).

JAPAN AND THE EUROPEAN WAR. Japan's activities throughout 1914 with regard to the European war had been mainly confined to the capture of Kiaochow and the imprisonment of German and Austrian soldiers and sailors. Early in January, 1915, a desire was manifested in the French press that Japan be asked to send troops to the western battle front. Prominent among those who advocated this action were M. Pichon and M. Clemenceau. The proposition was discountenanced in Great Britain on the ground that Kitchener would soon be able to send another British army to the Continent, and the Japanese would not be needed. Furthermore, Great Britain knew that Japan was likely to ask for financial assistance and freedom of action in China in return for her military aid, and British statesmen questioned whether the assistance which Japan might offer would be worth this price. Japan, however, had little thought of sending an army into France or Germany. Baron Kato, minister of foreign affairs, said late in January: "It is a question which should not be lightly discussed, as it has no direct bearing on either Japanese national existence or the peace of the Far East, and it further would seriously affect Japan's finances." Baron

Kato realized, however, that Japan would not be immune, if Germany were successful; therefore, he maintained that the country must be in readiness to send troops to Europe if it became necessary in order to ensure the success of the Allies. With the Chinese situation finally cleared up, Japan, in July, decided to offer aid to the Allies in the form of war munitions. Japanese forts in Manchuria were stripped of their great guns; boots, explosives, ammunition, and gun cases were manufactured in great quantities and shipped across Russia to the western front. New munitions factories were constructed in many parts of Japan, turning out great quantities of war supplies, for which France and Great Britain pledged payment. In August, the announcement was made that since the beginning of the war Japan had lost 1200 men in killed and wounded. Late in October, the Japanese government announced that, in accordance with a request which had been received ten days earlier, Japan had given her adhesion, October 19th, to the Pact of London, binding herself, as the other Entente Allies had already done, not to conclude a separate treaty of peace with the Central Powers.

For Japanese relations with the United States, consult UNITED STATES, *Foreign Relations*; for relations with China, consult CHINA.

JAPANESE POWDER. See ANTISEPTICS.

JAVA. See DUTCH EAST INDIES.

JEWISH AGRICULTURAL AND INDUSTRIAL AID SOCIETY. See AGRICULTURAL CREDIT.

JEWS AND JUDAISM. It is still impossible to give reliable and up-to-date statistics of the world's Jewish population. The most recent and authoritative estimate, that of *The American Jewish Year Book* for 1915-16, reckons the total Jewish population of the world as 13,277,542, distributed as follows: Africa, 413,259; America, 2,500,054; Asia, 356,617; Australia, 19,415; and Europe, 9,988,197. By countries, the same estimate shows 55,000 Jews in the Argentine Republic; 17,287 in Australia; 2,258,262 in Austria-Hungary; 15,000 in Belgium; 37,656 in Bulgaria; 75,681 in Canada; 100,000 in France; 615,000 in Germany; 6127 in Greece; 43,929 in Italy; 269,015 in Rumania; 8,060,415 in the Russian Empire; 5729 in Serbia; 4000 in Spain; 19,023 in Switzerland; 188,900 in Turkey; 245,000 in the United Kingdom; and 2,349,754 in the United States. Most of these figures, however, fall considerably below the actual present populations in the respective countries. For instance, Russia at the close of 1915 is estimated to have had approximately 7,000,000 Jewish inhabitants; the United States, 3,000,000; Galicia, 1,000,000; and Serbia, 6500. But the war, by creating a large "floating" Jewish population in the various war-zones, practically nullifies the most careful estimates. Likewise, ante-bellum estimates for the non-belligerent countries having an appreciable immigration in normal times are apt to run too high just to the extent that they are reckoned upon the regular tide of immigration which the war has checked.

GENERAL EVENTS. With close to three-quarters of a million Jews under arms and more than three-fourths of the world's Jewish population living in the war zone, all accounts of Jewish life and progress during 1915 must still be written in terms of the great world-conflict.

In the eastern European theatre alone more than half the Jews of the world are directly affected by the clash of arms, and it is estimated that over 250,000 of them have already been killed or incapacitated at the various war fronts. While in 1914 the greatest Jewish suffering prevailed in Galicia, this year the changing fortunes of war have wrought the greatest havoc among the Jews of what was formerly Russian Poland. In the German capture of Warsaw alone upwards of 300,000 Jews were concerned directly—and perhaps twice that number indirectly, since this great Polish city (with its 300,061 Jewish inhabitants in 1910) was the largest Jewish centre in Europe and the very heart and soul of east European Jewry. Likewise, with the fall of Kovno the greatest centre of Jewish culture in Russia was temporarily or permanently destroyed. Indeed, it appears that all the open country of Poland has been entirely denuded of its Jewish population, where it constituted one-sixth of the total number of inhabitants. Such of them as have not fled to the interior of Russia are now under German dominion, and the uncertainty of their social and political status makes their lot unusually precarious. Nor has the situation of the Palestinian Jews improved during the year. Even the herculean efforts of Ambassador Morgenthau could not check the Turkish atrocities, which not only have ruined the prosperous Zionist colony, but encompassed the ruin and expulsion of the rest of the Jews who would not embrace Mohammedanism and swear allegiance to the Crescent.

Under such untoward circumstances, all normal Jewish communal life has necessarily languished. Instead, all Jewish organized activity in the non-belligerent countries—and more especially in the United States—has been directed to measures of relief, appeals for which from Jewish war-sufferers, as from all others, taxed all the available resources. To cope with this unprecedented task, for which all the existing philanthropic organizations soon proved woefully inadequate, three special relief organizations were formed during the year—The American Jewish Relief Committee, The Central Relief Committee, and The People's Relief Committee—in the United States alone. The very energetic work of these organizations, all of which have their headquarters in New York City, may be set down as one of the greatest events of the year in Jewish life. Several million dollars have already been paid or pledged to the above-mentioned committees (over a million at a single mass meeting on December 21st in Carnegie Hall, New York) for Jewish relief in the war zone, and the \$5,000,000 mark will probably be reached early in 1916.

Along with these efforts toward temporary alleviation of want and suffering among their war-ridden co-religionists, the Jews of America have been making plans for the permanent betterment of Jewish life after the war. These involve the calling of a Jewish Congress, as soon as circumstances are favorable, to consider ways and means for safeguarding Jewish interests in all belligerent countries when peace shall have been made. Naturally, the date for such a convocation, which won the favor during the year of 23 large national and central Jewish organizations (with a total membership of 914,849) and of 950 independent organizations not affiliated

with any of the former, was not set during 1915. But the unwonted unanimity thus manifested is in itself one of the most significant Jewish events of the year, if not of the century.

DISABILITIES AND PERSECUTION. While the Jew's readiness to serve with the colors of his respective domicile has silenced considerable hostile criticism of the Jewish race, there has been no appreciable lessening of his disabilities or abatement in his persecution during the second year of the war. The only two instances of the former were the extension of the Pale of Settlement by Russia, which, forced to accommodate the large influx of Jews from Poland, thus made a virtue of necessity; and the granting of equal educational rights by Germany to her new Jewish subjects in the conquered Polish territory. But even this seemingly clear gain appears to have been offset by a loss in religious rights. The truth of the matter is that neither Russia nor Germany has shown a true change of heart so far as the Jews are concerned, although in the former many strong pleas were made in their behalf in the last Duma. Both evinced some eagerness at times, especially when the wavering fortunes of war on the plains of Galicia and Poland made military aid precious, to conciliate the Jews. But the moment the steam roller of the victorious army would pass, new horrors of abuse and persecution would be enacted. Thus, when Przemyśl was taken by the Russians (with the help of many Jewish soldiers, to be sure) about 7000 Jews were expelled from that Galician city. A somewhat similar act of ingratitude to the hundreds of thousands of Jews fighting under the Russian colors was the Tsar's suspension of every Jewish newspaper or periodical in the summer of 1915, while the postal edict against all Yiddish correspondence remained in full force, thus making impossible all written intercourse for thousands of Jews knowing but their own language. At the same time the Jews in the Russo-Prussian war-zone became the military scapegoats, whom the losing side would invariably blame for the changing fortunes of war, charging them with espionage and other connivance with the enemy. In this way over 500,000 Jews were expelled during the year from the eastern war-zone alone, while the treatment of those who were spared was but little better than downright expulsion. The only slight concession to Jewish pride by either Slav or Teuton in the year under review—and this so obviously a military measure—was Germany's prohibition of the circulation of picture-cards casting reflections on Jewish soldiers.

LABOR AND LEGISLATION. The year has been unusually free from large labor strikes involving the Jewish trades. Nor was there much legislation enacted affecting Jews in particular. In the United States Jewish interests were directly favored in several ways. Of these, the law passed by the Legislature of Pennsylvania (emulating that previously enacted by the Empire State) prohibiting all racial or religious discrimination in hotel or boarding-house advertisements is socially the most important. The new New York law making it a misdemeanor falsely to label meat or other food "Kosher" (that is, strictly in compliance with Jewish dietary principles) is another instance. Of general legislation concerning Jews, together with other foreign races, mention should be made of the defeat of the literacy test for voters in the State of New

York; the spread of the movement against Bible-reading in public schools; and the Supreme Court ruling, reversing two lower Federal Courts, that only the fitness of the immigrant, and not the external conditions of the place of his destination, should determine his admissibility to the United States. On the other hand, the compulsory Sunday-closing law, so onerous to Jewish storekeepers, remained on the statute books of New York and other States. The infamous Frank case furnished the only semblance of anti-Semitism in the United States during the year.

LITERARY AND MINOR EVENTS. The exodus of Jewish writers and scholars from belligerent Europe to the United States greatly diminished during 1915. Literary activity, however, has been stimulated considerably by the important arrivals of last year, as well as by the renewed general interest in Jews and Judaism incident to the war. By far the greatest Jewish literary event of the year was the actual completion of the new version of the Bible, upon which an eminent board of Jewish scholars and translators had been engaged for seven years. Of somewhat similar, though lesser importance, was the conference of Hebrew scholars, held on August 19th, to consider plans for the publication of the Hebrew classics. The formation in England of The Society of Hebraic Studies, with the object of encouraging Jewish learning and research, may be regarded as one of the most promising literary-educational Jewish events of the year. Among minor and miscellaneous events of Jewish communal or religious life, we may mention the celebration of the 25th anniversaries of the Baron de Hirsch Fund, the Educational Alliance of New York, and the Relief Societies of Newark and Kansas City; the golden jubilee of the Temple Israel of Akron, and the Jewish Hospital of Philadelphia; the 70th anniversary of the Temple Emanuel, which has thrown its doors open during the year to daily noon-hour services; and the 75th anniversary of the Beth Israel Congregation of Philadelphia. In this connection, the dissolution of the Jewish Social Service Federation of Denver, Colo., might also be mentioned.

ZIONISM. Whatever is to be the future of Zionism after this great war—and it is very likely to take on new life and meaning as a result of the war's bitter lessons—for the present this spiritual movement is absolutely at a standstill. The year under review completed the ruin of the prosperous and promising Jewish colony in Palestine which, before the war broke out, seemed destined to reach the 150,000 population mark by 1920. At the same time the exigencies of war-relief, as already stated, have completely diverted all Jewish organized endeavor into other directions. Under this double set-back, necessarily accentuated during the second year of war, the Zionist cause has made no progress whatever in 1915. It has, on the contrary, gone considerably backward so far as its objective manifestation is concerned. Under these circumstances, the death during the year of the famous Zionist leader, David Wolffsohn, assumes a somewhat symbolic significance.

JITNEY. During 1915 there spread through the western part of the United States, and even in certain Eastern States, a movement in city transportation which had its effect on the older methods and aroused considerable discussion.

This was the use of itinerant automobiles or auto busses known as "jitneys," a term that originated in Los Angeles and originally represented the five-cent piece. The first jitneys were to be seen in Los Angeles, and from that city the idea spread to San Francisco, Seattle, and other coast cities, Texas, to Detroit, Toledo, and throughout the United States. The vehicles employed varied all the way from four-passenger cars, which often were loaded far in excess of their capacity, to large busses, and the routes selected were along the most traveled highways. The rule was to receive five cents for any length of ride within the limits of operation, and many owners of cheaper cars rushed into this business which originally was carried on without franchise or municipal regulation. Naturally the competition was felt by the street railway or omnibus lines operating under franchise and in many cases returning to the city a portion of their receipts for the privilege of carrying on such service. Like other civic ideas with so rapid a spread, the jitney flourished for a few months, and while it continued in a certain number of cities on more favorable routes, yet it was not considered a permanent feature. The depreciation, even on the cheaper cars employed, was too much to make the undertaking profitable, and while the public was anxious to avail itself of such cheap means of transportation, the operators soon came to realize the lack of profit. Municipal councils were called upon to protect the holders of franchises as well as the users of the streets by adopting license regulation systems which interfered materially with the ease with which the jitney could be put to work.

JOFFRE, JOSEPH JACQUES CÉSAIRE (1852—). A French soldier and mathematician, born in Rivesaltes, Pyrénées. He was a student of military engineering at the Ecole Polytechnique when the Franco-Prussian War broke out. He served with an artillery battery during that war. He became a captain in 1874 and fought at Tongking and in Dahomey. He took an active part in the French occupation of Timbuctu (1894) and in the campaigns in Madagascar (1897). Upon his return to France he taught in the Higher War School. In 1911 he was appointed chief of the general staff. He was an ardent advocate of the three years' military service bill which became a law in 1913. Upon the outbreak of the great war in 1914, he was made commander in chief of all the French armies, and was the guiding genius who turned back the great German offensive against Paris in the battle of the Marne (September, 1914). President Poincaré decorated him with the military medal for his efficient service in this war. See *FRANCE, History*; and *WAR OF THE NATIONS*.

JOHNS HOPKINS UNIVERSITY. An institution for higher learning and special education, founded at Baltimore, Md., in 1876. The total number in all departments (including summer students) in the autumn of 1915 was about 1600. The faculty numbered 256. E. H. Griffin, dean of the college faculty, resigned in June, 1915, and M. P. Brush was appointed acting dean. The productive funds of the university at the end of the fiscal year 1915 amounted to about \$7,000,000, and the income during 1914-15 to \$545,149. The library contained about 190,000 volumes.

JOHORE. A native state located at the

southern extremity of the Malay Peninsula, and under British control. Estimated area, 9000 square miles; population (1911), 180,412, about half Malays and one-third Chinese. Johore Bharu, the capital, has about 20,000 inhabitants. Imports and exports (1913), 9,304,509 and 14,212,850 Straits Settlements dollars. Revenue and expenditure (1913), 4,378,555 and 3,267,484 dollars; public debt, 8,852,492 dollars. A railway, constructed by the Federated Malay States Railways, connects Kuala Gemas on the Negri Sembilan border with Johore Bharu (120½ miles).

JONES, HENRY ARTHUR. See **DRAMA, AMERICAN AND ENGLISH.**

JOYCE, JOHN ALEXANDER. An American soldier and writer, died Jan. 18, 1915. He was born at Shraugh, Ireland, in 1840, and when still a young man removed with his parents to Connecticut. He graduated from the Highland Literary Institute in 1859, and afterwards studied law. He entered the Union service as a private in 1861, rising to the rank of second lieutenant in the following year, but was discharged for wounds in 1864. After the war he practiced law, at the same time devoting much time to writing. His published writings include: *Checkered Life* (1883); *Peculiar Poems* (1885); *Jewels of Memory* (1896); *Complete Poems* (1899); *Oliver Goldsmith* (1900); *Edgar Allan Poe* (1901); *Personal Recollections of Shakespeare* (1901); *Robert Burns*; and *The Life of Lincoln*.

JUDAISM. See **JEWS AND JUDAISM.**

JUPITER, SATELLITES OF. See **ASTRONOMY.**

JUVENILE COURTS. Juvenile courts are at present largely restricted to the cities, and in rural communities arrest and conviction are for the most part still in use. The West of the United States is in advance of the East in this matter. The advocates of the juvenile court with its probation officers and social service work urge that seeking out and remedying social conditions is more important than technical trials and verdicts. The condition of the child must be considered rather than the majesty of the law. However, it is felt that the impression must be made that proceedings are connected with established legal principles. The abolishment of trial by jury and its replacement by private hearings before the judge, with the motive of protecting erring and delinquent children as well as their parents, is now very widely approved. The delinquent child is considered in need of the protection and care of the State. Clinics are recommended to correct physical defects in children which are held in large degree to be responsible for violations of the law, and such clinics have now been established in most of the larger cities. Mr. Bernard Flexner even suggested that in speaking of child delinquency criminal terminology be altogether abandoned.

SCIENTIFIC STUDIES. One of the most important phases of the development of the juvenile court idea is the opportunity afforded to make numerous physical and psychological examinations of delinquent children. Thus the psychopathic laboratories and clinics in connection with the Chicago Boys' Court, and the juvenile courts at Boston and New York, showed from numerous observations that a large proportion of the defendants, especially the repeaters and those arrested on trivial charges, were mentally subnormal and therefore unfit to meet the requirements

of city life and discipline. Some investigators have estimated the proportion of feeble-minded among child-offenders as high as 25 per cent or more. But Dr. Augusta F. Bronner, assistant director of the Psychopathic Institute, attached to the Juvenile Court in Chicago, thinks this a gross exaggeration. She made a study of 505 boys and girls in the detention home of the Juvenile Court. She found 88.9 per cent of these children undoubtedly normal, 90.6 per cent of the boys and 87.2 per cent of the girls; 7 per cent of the boys and 11.2 per cent of the girls were feeble-minded, and 2.4 per cent were doubtful. She emphasized the point that the proportion of subnormal was probably not over 10 per cent and therefore not nearly so large as careless investigators have led us to expect.

THE OHIO BUREAU OF JUVENILE RESEARCH, established July 1, 1914, works on the principle that the welfare of the race requires that artificial restraints be imposed on the undue multiplication of defective stocks. One section of the Ohio statute says, "All minors, who in the judgment of the court require State constitutional care and guardianship, shall be wards of the State and shall be committed to the care and custody of the 'Ohio Board of Administration,' which board thereupon becomes vested with the sole and exclusive guardianship of such minors." The records of observations and examinations upon children are to be kept in the most scientific manner and will enable the authorities to deal with each child much more intelligently than heretofore.

JUDGE LINDSEY. Judge Ben B. Lindsey, founder of the Juvenile Court of Colorado, was arrested on the charge of contempt of court and of conniving at the commission of perjury. The case developed as follows: A 12 year old boy, the son of a woman under trial for murder of her husband, testified that he fired the fatal shot while striving to wrest from his mother's hands the gun which she picked up in self defense. The boy was brought before Judge Lindsey and examined as to the accuracy of his story after a pledge of sacred confidence on the part of the judge. The judge claimed he desired to make tests of the boy's veracity because of the value of such psychological experiments in his work as judge of the juvenile court. Judge Lindsey was then called upon to testify at the trial and reveal what the boy had told him. He refused to disclose what he had learned, saying that such action would destroy the strength of the juvenile court. He was then tried before Judge Perry of the Second Judicial District of Colorado, who handed down the decision that Judge Lindsey was guilty. This case was appealed to the Supreme Court of the State. "The whole theory of the juvenile court is founded on the building up of a relation of trust between the judge and those who come before him in the position of wards. The successful handling of each new problem which confronts the judge is based upon the reputation for fairness and honor which he has established in treating the problems of the past." * While opinion was divided as to Judge Lindsey's guilt when viewed from narrow legalistic points of view, there was general belief that on broad principles of public policy his action was justified. See also **COLORADO, Politics.**

KAISER-WILHELMSLAND. That part of what was, until the War of the Nations, the

* *The Outlook*, 110 : 846.

protectorate of German New Guinea, which is in the Island of New Guinea. The area, estimated at 70,135 square miles, is about the same as that of Oklahoma. See GERMAN NEW GUINEA.

KAMERUN. A German protectorate on the west coast of central Africa, between Nigeria and French Equatorial Africa. Its northerly extension reaches Lake Chad, and its easterly, at one point, the Ubangi River. The coast line is broken by Río Muni y Cabo San Juan (Spanish Guinea). The estimated area is 790,000 square kilometers (305,000 square miles, an area about 46 per cent greater than that of Germany, or nearly three times as large as New York, New Jersey, and Pennsylvania combined). Exclusive of the inhabitants of the territory ceded by France in 1911, the native population is estimated at 2,649,000; other colored, 2000; the population of the ceded territory is supposed to approximate 1,000,000. The number of whites, Jan. 1, 1913, was 1871, of whom Germans, 1643. Missions, three Protestant, and one Roman Catholic. Government schools, four, with over 800 pupils. Upwards of 24,000 pupils receive mission instruction. In the year 1912-13, 72 whites and 11,229 natives were convicted in the courts. The military in 1914 included 205 Germans and 1650 natives; police, 47 and 1450. Imports and exports increased in value from 23,806,000 and 12,500,000 marks respectively in 1907 to 25,580,000 and 19,924,000 in 1910, 34,242,000 and 23,336,000 in 1912, and 34,616,000 and 29,151,000 in 1913. Chief exports in 1912 and 1913: Rubber, 11,302,000 and 12,122,000 marks; palm kernels, 4,406,000 and 6,226,000; cacao, 3,721,000 and 5,718,000; palm oil, 1,622,000 and 1,961,000; kola nuts, 167,000 and 971,000; timber, 696,000 and 941,000; ivory, 536,000 and 824,000. Imports from and exports to Germany in 1911, 23,047,000 and 18,471,000; in 1912, 27,216,000 and 19,841,000. At the end of 1913 there were in operation 310 kilometers (193 miles) of railway, the Northern Railway having an extension of 160 kilometers, and the Midland, 150; under construction, 133 kilometers. Local revenue in 1912-13 and 1913-14, 8,900,000 and 11,306,000 marks respectively; expenditure, 13,340,000 and 17,260,000; in the former year an additional expenditure of 2,000,000 marks was met by a loan, and in the latter year 15,230,000 marks. The budget for 1914-15 balanced at 32,490,409 marks, estimated local receipts amounting to 14,094,091 marks; imperial contribution, 3,163,318; and loan, 15,230,000. The administrative headquarters is Buéa.

The Anglo-French forces which had begun the invasion of the Kamerun protectorate in the autumn of 1914 (see 1914 YEAR BOOK) made rapid progress in 1915. While a blockade was maintained against the coast, a French column advanced up the Sanaga River, penetrating inland from Duala and Edea, which had been captured in 1914. A simultaneous attack was delivered in the north from the direction of Yola (in Nigeria). The forces from Nigeria succeeded in capturing Garue, on the Benue River, on June 11th. Ngaundere, over 100 miles further south, fell on June 29th. The German forces, attacked from both sides, were unable to put up any effective resistance, and the greater part of the colony fell into the hands of the Allies.

KANSAS. POPULATION. The population of the State in 1915 according to the decennial cen-

sus was 1,072,545. In 1910 the population was 1,690,949.

AGRICULTURE. The acreage, production, and value of the principal crops estimated by the United States Department of Agriculture in 1914-15 were as follows:

		Acreage	Prod. Bu.	Value
Corn	1915	5,500,000	172,050,000	\$87,746,000
	1914	5,850,000	108,225,000	68,182,000
Wheat	1915	8,525,000	108,588,000	94,819,000
	1914	8,660,000	177,200,000	168,840,000
Oats	1915	1,650,000	48,725,000	16,178,000
	1914	1,760,000	58,960,000	24,763,000
Rye	1915	50,000	800,000	608,000
	1914	50,000	1,000,000	800,300
Barley	1915	270,000	8,370,000	3,515,000
	1914	240,000	5,880,000	2,764,000
Potatoes	1915	71,000	5,898,000	4,861,000
	1914	72,000	4,464,000	3,437,000
Hay	1915	1,766,000	4,062,000	22,747,000
	1914	1,650,000	2,492,000	18,441,000
a Tons.				

LIVE STOCK. The United States Department of Agriculture estimated that on Jan. 1, 1916, and Jan. 1, 1915, horses numbered 1,109,000 and 1,132,000, valued at \$107,573,000 and \$105,276,000; mules numbered 245,000 and 233,000, valued at \$25,725,000 and \$23,766,000; milch cows numbered 762,000 and 726,000, valued at \$46,177,000 and \$46,101,000; other cattle numbered 1,945,000 and 1,768,000, valued at \$81,106,000 and \$75,140,000; sheep numbered 341,000 and 316,000, valued at \$1,910,000 and \$1,548,000; swine numbered 2,815,000 and 2,656,000, valued at \$25,616,000 and \$26,826,000. The production of wool in 1915 and 1916 was 1,403,000 and 1,456,000 pounds, respectively.

MINERAL PRODUCTION. The production of coal in the State in 1914 was 6,860,988 short tons, valued at \$11,238,253. This is a decrease of 341,222 tons and \$798,039 in value under the output of 1913. There were no strikes of importance during the year. The number of men employed in the coal mines in 1914 was 12,413. There were 31 fatal accidents. The output of petroleum in 1914 increased by more than 30 per cent. There were produced 3,103,585 barrels, compared with 2,375,029 barrels in 1913. The value of oil in 1914 was \$2,433,074, compared with \$2,248,283 in 1913. The total value of mineral products in 1914 was \$25,866,351.

EDUCATION. The total school population of the State on June 30, 1914, was 310,803. Of this, 154,047 were males and 156,756 were females. The total number of schools was 14,844. In the high schools were enrolled 42,831 pupils. The total expenditures for educational purposes were \$12,210,174.

CHARITIES AND CORRECTIONS. The charitable and correctional institutions under the control of the State include the State Sanitarium for Tuberculosis at Norton, the State Orphan's Home at Atchison, Parsons State Hospital for Epileptics, State Home for the Feeble-minded at Winfield, the Osawatimie State Hospital for the Insane, Topeka State Hospital for the Insane, Larned State Hospital for the Insane. The Legislature of 1915 provided that at the tuberculosis sanitarium, counties should pay three dollars a week for county patients, and that private patients should pay ten dollars per week.

FINANCE. The report of the State treasurer for the fiscal year ending June 30, 1914, showed a balance on July 30, 1913, of \$1,735,276. The receipts for the period amounted to \$8,999,649,

and the disbursements to \$9,283,607, leaving a balance on June 30, 1914, of \$1,451,318. The State bonded debt amounted to \$1,590,000, and will be paid in full on Jan. 1, 1916.

TRANSPORTATION. The total railway mileage in the State on Jan. 30, 1914, was 7366. Of this, 5226 was single track, and 269 second track. The remainder was yard track and sidings. Railroads having the longest mileage were the Missouri Pacific, 2061; Atchison, Topeka, and Santa Fé, 1820; Chicago, Rock Island, and Pacific, 1133.

POLITICS AND GOVERNMENT. The Legislature met in 1915 and passed several important measures. These included two measures aimed at strengthening the prohibition law of the State. One of these provided that the municipality where liquor is sold is liable for damage for injury to persons or property resulting from intoxication. The other measure was aimed at those who permit so called "keg parties" to be held on their premises. It opposes similar liability upon the owner of the property where liquor is sold or given away. (See also **LEGISLATION IN 1915; LIQUOR REGULATION.**) By rule of the State Civil Service Commission beginning with July 1, 1915, all State employees must be total abstainers. On January 25th, the United States Supreme Court declared unconstitutional the Kansas statute which prohibited an employer from requiring that an employee should not be a member of the labor union.

STATE GOVERNMENT. Governor, Arthur Capper; Lieutenant-Governor, W. Y. Morgan; Secretary of State, J. T. Botkin; State Auditor, W. E. Davis; State Treasurer, Earl Akers; Attorney-General, S. M. Brewster; Superintendent of Public Instruction, W. D. Ross; Superintendent of Insurance, Carey J. Wilson.

JUDICIARY. Supreme Court: Chief Justice, William A. Johnston; Justices, Rousseau A. Burch, Henry F. Mason, John Marshall, Silas Porter, John S. Dawson, J. S. West.

STATE LEGISLATURE:

	<i>Senate</i>	<i>House</i>	<i>Joint Ballot</i>
Democrats	21	49	70
Republicans	18	66	84
Progressives	1	9	10
Socialists	0	1	1
Majority	2 D	7 R	8 R

KANSAS, UNIVERSITY OF. A State institution for higher education founded in 1866 at Lawrence, Kan. The total enrollment in all departments in the autumn of 1915 was 2490. The faculty numbered 218. There were no notable changes in the membership of the faculty during the year, and no noteworthy benefactions were received. The university is supported almost entirely by legislative appropriations, which amounted in 1915-16 to \$625,000, and has an endowment fund of about \$150,000. The library contained 100,000 volumes.

KAOLIN. See **FULLER'S EARTH.**

KAUSOLITE. See **CHEMISTRY, INDUSTRIAL, Explosives.**

KEDAH. A native state on the west coast of the Malay Peninsula, under British protection. Area, with the Langkawi group of islands, 3800 square miles. According to the 1911 census, the population was 245,986, of whom 80 per cent were Malay and 13 per cent Chinese. Sam-sams numbered nearly 65,000, and Siamese over

8000. Capital, Alor Star. The soil is fertile, and rice, coconuts, and rubber are planted. Estimated revenue for the year 1913, 2,407,195 Straits Settlements dollars; expenditure, 2,341,238. Native affairs are administered by the Sultan (Abdul Hamid Halimshah ibni Ahmat Tajudin), or at present, on account of the Sultan's ill-health, by his eldest son (Tunku Ibrahim) as regent. There is a British adviser. The loan (2,600,000 S. S. dollars), negotiated with the Siamese government in 1905, was taken over by the Federated Malay States government upon the transfer in 1909 of the suzerainty of the state from Siam to Great Britain.

KELANTAN. A protected native state on the eastern side of the Malay Peninsula; administered by the hereditary Rajah, Muhammed (IV) bin Almerhum Sultan Muhammed, under the direction of a resident British adviser. The area is estimated at 5870 square miles, and the population (1911) at 286,752 (268,707 Malays, 9844 Chinese, 5355 Siamese, 108 Europeans). Chinese laborers are brought in to work on the rubber plantations. Kota Bharu, the capital, has about 12,000 inhabitants, and contains the Rajah's palace and the British residency. Other towns are Tumpat (4000 inhabitants), Bachak (2000), Tabal (2000), Pasir Puteh (2000). Agriculture, rubber cultivation, cattle-raising, and fishing are the principal industries; rice and paddy, copra, rubber, and betel nuts are exported. Gold is mined and tin deposits occur. Roads are building, and a railway from Tumpat is under construction across the state, to connect ultimately with the Federated Malay States system. The (1913) imports amounted to 3,948,325 Straits Settlements dollars; the exports, to 2,022,307; the revenue was 676,020, and the expenditure, 672,137. Kelantan was formally ceded by Siam to the protection of Great Britain, July 15, 1909.

KELP. See **FERTILIZERS.**

KENNEDY, SIR WILLIAM RANN. An English jurist, died Jan. 15, 1915. He was born in 1846, educated at Eton, and King's College, Cambridge, and later became a fellow of Pembroke College, Cambridge. In 1871 he was made a barrister at Lincoln's Inn, and in 1885 was appointed Queen's Counsel. He was Judge of the King's Bench Division of the High Court of Justice from 1892-1907, in the latter year being made a Lord of Appeal, and knighted. He was one of the foremost authorities on maritime law. He contested several seats in Parliament.

KENTUCKY. **POPULATION.** The estimated population of the State on July 31, 1915, was 2,365,185. The population in 1910 was 2,289,905.

AGRICULTURE. The acreage, production, and value of the principal crops estimated by the United States Department of Agriculture in 1914-15 were as follows:

	<i>Acreage</i>	<i>Prod. Bu.</i>	<i>Value</i>
Corn 1915	3,800,000	114,003,000	\$63,840,000
..... 1914	3,650,000	91,250,000	58,400,000
Wheat 1915	900,000	9,900,300	10,395,000
..... 1914	760,000	12,540,000	12,916,000
Oats 1915	210,000	5,460,000	2,621,000
..... 1914	175,000	3,675,000	1,948,000
Rye 1915	24,000	288,000	271,000
..... 1914	22,000	801,000	286,000
Barley ... 1915	6,000	180,000	189,000
..... 1914	5,000	142,000	109,000
Potatoes .. 1915	51,000	6,426,000	3,534,000
..... 1914	50,300	2,450,000	1,990,000

	Acreage	Prod. Bu.	Value
Hay 1915	875,000	a 1,225,000	15,812,000
1914	750,000	712,000	11,892,000
Tobacco ... 1915	440,000	b 856,400,000	27,799,030
1914	400,000	864,000,000	80,576,000
a Tons. b Pounds.			

LIVE STOCK. The United States Department of Agriculture estimated that on Jan. 1, 1916, and Jan. 1, 1915, horses numbered 434,000 and 443,000, valued at \$39,060,000 and \$42,085,000; mules numbered 229,000 and 231,000, valued at \$23,358,000 and \$24,486,000; milch cows numbered 406,000 and 390,000, valued at \$18,189,000 and \$17,745,000; other cattle numbered 570,000 and 543,000, valued at \$17,556,000 and \$16,507,000; sheep numbered 1,155,000 and 1,229,000, valued at \$5,660,000 and \$5,162,000; swine numbered 1,709,000 and 1,582,000, valued at \$11,108,000 and \$11,390,000. The production of wool in 1915 and 1914 was 3,643,000 and 3,552,000 pounds, respectively.

MINERAL PRODUCTION. The output of petroleum was 502,441 barrels, compared with 524,568 barrels in 1913. The value of the oil produced in 1914 was \$498,556, compared with a value of \$675,748 in 1913. The output of coal in 1914 surpassed all previous records. There were mined 20,382,763 short tons, valued at \$20,852,463. This exceeded the previous high mark in 1913 by 766,163 tons. The increase was all the more notable because it was made in the year when most of the coal fields in the country showed a decrease, and it was due to activity in the coal mining in the eastern part of the State, particularly along the Virginia border, and to the construction of new railroads. The number of men employed increased from 26,332 in 1913 to 28,764 in 1914. The number of fatal accidents during the year was 61. The value of the total mineral production in 1914 was \$26,668,474.

EDUCATION. The latest available statistics for education are for 1914. In that year the total school population was 725,204. The enrollment in the public schools was 517,299, and the average daily attendance was 362,602. The total number of teachers in that year was 11,300. The average monthly salary of male teachers was \$52.47, and of female teachers, \$43.92. The disbursements for educational purposes in rural schools were, in 1913, \$4,390,507, and for city schools, \$2,248,964.

FINANCE. The report of the State treasurer for the fiscal year ending June 30, 1914, which is the latest report available, showed a balance in the treasury on July 1, 1912, of \$312,549. The receipts for the year amounted to \$7,666,781, and the debt to \$7,605,427, leaving a balance on July 30, 1913, of \$361,903.

CHARITIES AND CORRECTIONS. The charities and corrections under the State Board of Control include the Eastern State Hospital at Lexington, Central State Hospital at Lakeland, Western State Hospital at Hopkinsville, and Feeble-minded Institute at Frankfort. The total average per capita cost of maintenance of the inmates of these institutions for the year ending June 30, 1915, was \$156,027.

TRANSPORTATION. The total operating mileage in the State on June 30, 1915, was 3951. This is less than the operating mileage on June 30, 1914, because the tracks of two railroads, measuring in all 41 miles, were torn up and discontinued. The tangible property of the State railways in 1914 was valued at \$70,261,072.

POLITICS AND GOVERNMENT. In the August primaries Augustus O. Stanley, former Congressman, was nominated by the Democrats for Governor, E. P. Morrow by the Republicans, and Fred J. Drexler by the Progressives. On November 2nd, Mr. Stanley, Democrat, was elected. At a special term of the Circuit Court of Pikeville began, February 1st, a trial of 1100 voters who were charged with bribery alleged to have been committed in the election of 1914. More than 2000 indictments were returned in the various counties in the eastern part of the State. On February 5th, 11 of the persons under trial were convicted and 4 acquitted. A fine of \$100 and disfranchisement was imposed on all those found guilty.

Sixty-five persons, some of them citizens of prominence, were arraigned in the court at Hartford in August, when the State began its prosecution of the alleged members of the band of night-riders, who under the guise of hunters had terrorized the western part of the State for months, whipping men and women, and killing one negro. Two of the men on trial pleaded guilty and were sentenced to three years each in the penitentiary. The authorities alleged that scores of persons, white and black, were whipped by the night-riders and their homes riddled with bullets; the purpose of the riders being to "regulate conduct," displacing blacks with whites in labor, and fixing prices of goods in the stores of western Kentucky.

STATE GOVERNMENT. Governor, A. O. Stanley; Lieutenant-Governor, James D. Block; Secretary of State, Barksdale Hamlett; Treasurer, Sherman Goodposter; Auditor, Robert L. Greene; Attorney-General, M. M. Logan; Superintendent of Education, V. O. Gilbert; Commissioner of Agriculture, M. S. Cohen—all Democrats.

JUDICIARY. Court of Appeals: Chief Justice, Shackelford Miller; Justices, W. E. Settle, C. C. Turner, J. B. Hannah, John D. Carroll, C. S. Nunn, Rollin Hurt; Commissioner of Appeals, W. R. Clay; Clerk, Robert L. Greene.

STATE LEGISLATURE:

	Senate	House	Joint Ballot
Democrats	27	63	90
Republicans	11	37	48
Democratic majority..	16	26	42

KHARSIVAN. See SALVARSAN AND NEOSALVARSAN.

KIAOCHOW. A harbor town (Tsingtao) and district on the east coast of the Chinese province of Shantung, leased by Germany from China for 99 years from March 6, 1898. The district was declared a German protectorate April 27, 1898. Area of the protectorate (exclusive of the bay), 552 square kilometers (213 square miles). Native population, about 190,000; whites, Jan. 1, 1913, 4470, of whom Germans, 4256. Imports and exports (including the trade of the hinterland passing through Tsingtao) were valued at 82,374,000 and 34,225,000 marks respectively in the fiscal year 1907; in 1910, 65,464,000 and 54,732,000; in 1912, 114,938,000 and 80,295,000; in 1913, 121,254,000 and 79,640,000. In the last two years, imports from China were valued at 47,880,000 and 32,439,000 marks respectively. The larger imports in the fiscal years 1912 and 1913, in thousands of

marks: cotton yarn, 21,427 and 29,161; cotton goods, 24,640 and 23,752; paper, 10,978 and 9440; petroleum, 5516 and 5393; aniline dyes, 3897 and 4802; sugar, 3687 and 4586; matches, 4188 and 4577; metals, 2480 and 3742; cigarettes, 1927 and 2478. Leading exports in the fiscal years 1912 and 1913, in thousands of marks: straw braid, 33,398 and 17,590; peanuts, 10,848 and 11,691; Shantung pongs, 4058 and 8009; yellow silk, 6479 and 7507; raw cotton, 3424 and 5612; cattle hides, 1770 and 3169; cattle, 1511 and 2671; coal, 2573 and 2593. Vessels (exclusive of junks) entered at Tsingtao in 1912, 785, of 1,209,154 tons. The Shantung Railway, with a length of 434.4 kilometers (270 miles), extends from Tsingtao to Tsinan, the capital of Shantung, with a branch from Changtien to Poshan. Local revenue in the fiscal years 1913 and 1914, 7,230,000 and 8,065,000 marks; expenditure, 16,790,000 and 18,410,000. For the year 1914-15, the budget balanced at 18,411,590 marks, estimated local receipts amounting to 1,358,387 marks; imperial contribution, 9,988,602; and treasury balance, 1,358,387.

The leased territory of Kiaochow was surrendered to Japanese forces by Germany on Nov. 10, 1914 (consult 1914 YEAR BOOK, p. 775). The future status of Kiaochow was the subject of negotiations between China and Japan during the year 1915 (see CHINA), and on May 25th the Japanese government promised that Kiaochow would be returned to China after the war, on condition that the German privileges in the leased territory be turned over to Japan.

KING, HENRY. An American editor, died March 15, 1915. He was born in Salem, Ohio, in 1842. His family went to Illinois when he was still a boy and there he learned the printer's trade. He enlisted in the Union army in the Civil War, and retired with the rank of captain. In 1883 he became a member of the staff of the St. Louis *Globe-Democrat* after having for several years edited papers in Topeka, Kan., and Quincy, Ill. In 1897 he was appointed managing editor of the *Globe-Democrat* and held this position until shortly before his death. In 1891 he organized a Republican Editorial Association in Missouri.

KITCHENER, FIELD MARSHAL EARL. See GREAT BRITAIN, *History*, and WAR OF THE NATIONS.

KLEIN, CHARLES. An American playwright, died May 7, 1915. He was born in London in 1867, and was graduated at North London College. He moved to the United States, where he was employed as a play reader by Charles Frohman. In 1890 he wrote his first play, *A Mile a Minute*, and two years later *By Proxy*. His first important success was *The District Attorney* (1895), in which he collaborated with Harrison Grey Fisk. To his earlier period belong also: *Heartsease* (1897); *The Auctioneer* (1901); and *The Honorable John Grigsby* (1902). He made a remarkable success later with *The Music Master* (1904), which was written for David Warfield, and in 1905 this was followed by *The Lion and the Mouse*, also a success. Among his other plays may be mentioned: *Daughters of Men* (1906), *The Third Degree* (1908), and *The Gamblers* (1910). Mr. Klein was a victim of the torpedoing of the *Lusitania*. See also DRAMA, AMERICAN AND ENGLISH.

KLUCK, ALEXANDER HEINRICH RUDOLF VON. See WAR OF THE NATIONS.

KODAK DECISION. See PHOTOGRAPHY.

KOLLEN, GERRET JOHN. An American educator, died Sept. 5, 1915. He was born in the Netherlands in 1843, and removed to the United States in 1851. In 1868 he graduated from Hope College, and became assistant professor of mathematics and natural philosophy in that college in 1871. In 1878 he was appointed professor of applied science and economy, and in 1893 was chosen president. He served until 1911 when he was retired as president emeritus. During his connection with the college he secured endowments aggregating \$500,000, and new buildings valued at \$150,000.

KOREA, or officially **CHOSEN.** A country of eastern Asia occupying the peninsula between the Yellow Sea and the Sea of Japan. It was formerly an independent monarchy; it became a Japanese protectorate March 2, 1906, and was annexed to Japan Aug. 29, 1910. The capital is Seoul.

AREA, POPULATION, ETC. The estimated area is 14,123 square ri (84,606 square miles). The population in 1913 was estimated at 15,164,066, and in 1914 at 15,508,872. The population for 12 prefectures on April 1, 1915, was 15,458,863. Population of the chief towns (1911): Seoul, 256,381; Fusan, 81,438; Kwangju, 42,910; Pingyang, 39,769; Haisyong, 38,025; Taiden, 32,822; Taiku, 31,140; Chemulpo, 26,187; Wonsan, 20,093. At the end of 1912, Japanese inhabitants numbered 243,729 (131,518 males, 112,211 females), and foreigners 16,589 (15,212 and 1377). The foreigners are chiefly Chinese. Christianity has made considerable progress in Korea, but ancestor worship prevails throughout the country. There are numerous mission schools.

Schools in 1913: Japanese: primary, 199, with 691 teachers and 21,882 pupils; other, 14, with 163 teachers and 1974 pupils. Native: primary, 367 schools, with 1586 teachers and 43,562 pupils; other, 1341 schools, with 3196 teachers and 57,385 pupils.

PRODUCTION, COMMERCE, ETC. Agriculture is the only important industry, but cultural methods are primitive and transportation facilities inadequate. The principal crops are rice and other cereals, beans, tobacco, hemp, cotton, and ginseng. Stock raising and sericulture are practical. Live stock as reported for 1912: cattle, 1,040,720; horses, 46,565; goats, 10,373; swine, 625,095. Various minerals occur, but there is little mining; gold mining, however, is carried on with some success. The gold output was valued at 4,433,838 yen in 1911, and 4,579,063 yen in 1912. Fisheries products were valued at 9,035,445 yen in 1911, and 12,619,356 yen in 1912.

Imports and exports of merchandise were valued in 1912 at 67,115,447 and 20,985,617 yen, respectively; in 1913, 71,580,247 and 30,878,944; in 1914, 53,606,448 and 15,667,340. Leading imports are cotton piece goods, cotton yarn, timber, kerosene, sugar, coal, wheat and flour, matings, galvanized iron, etc. The principal exports in 1912 and 1913, respectively, were, in thousands of yen: rice, 7525 and 14,494; beans, 5001 and 5719; cattle hides, 1032 and 1268. The gold export in 1913 was valued at 9,972,515 yen. The trade is principally with Japan.

Railway open to traffic at the end of 1914, 992 miles. The Korean railway system is connected with the Russian and Chinese systems by the line running from Antung to Mukden. Telegraph

line, 3785 miles. Post offices in 1912, 532; in 1913, 559.

The second railway programme, which involved the construction of lines connecting the capital with Wŏnsan (Gensan) on the northeast coast, and Taiden on the Seoul-Fusan line with Kunsan and Mokpo in the southwest, was completed in 1914, the Konan (Honam) Railway being finished in January, and the Keigen (Seoul-Gensan) Railway in August. The Gensan-Yongheung line, which formed a part of the third programme, was started on October 1st, and that portion of the track which runs from Gensan to Munchong, a distance of five miles, was nearing completion in 1915. The reconstruction of the Seoul-Fusan line was begun on Oct. 5, 1914, and the work on the Chongjin-Hoiryong Railway (58.6 miles) was started during the same month. They were to be completed in four years. The total mileage of railways in operation in Korea was 994 miles. During 1914 the following sections were opened: Seiyu to Koteiri on the Konan line, 35.5 miles; and Kenfutsuro to Kozan on the Keigen line, 23.8 miles; making a total of 59.3 miles newly opened to traffic. Surveying was in progress on the following lines, though it had not been decided when the actual construction would be undertaken: (1) Taiku to Mokpo; (2) Hamheung to Chongjin; (3) Pingyang to Gensan; (4) a line running along the Yalu River.

The monetary unit is the yen, par value 49.846 cents. In the year 1912-13, revenue and expenditure amounted to 62,126,894 and 51,781,225 yen, respectively; the 1914-15 budget balanced at 59,412,966 yen. The Governor-General is Gen. Count Terauchi Masakata.

KURIA MURIA ISLANDS. Attached to ADEN (q.v.).

KWANGCHOW-WAN. A territory on the coast of the Chinese province of Kwangtung, leased by China to France for 99 years from April 11, 1898. It forms a division of French Indo-China. The area is stated at 1000 square kilometers. The population in 1911 was about 158,881. The budget for 1914 balanced at 323,000 piasters.

KWANTO. See KWANTUNG.

KWANTUNG. Japanese name, KWANTO. A Japanese leasehold in the southern part of the Liaotung peninsula, Manchuria. The area is 1221 square miles. The population at the end of 1912 is stated at 570,421, as compared with 547,145 at the end of 1911. These figures include residents of Kwantung who were in Manchuria. In 1910, Dairen, the chief port, had 40,758 inhabitants; Ryojun (Port Arthur), 16,797. Imports and exports in 1912, 46,132,749 and 56,782,534 yen, respectively; in 1913, the imports were valued at 59,839,330 yen. Trade is principally with Japan. Kwantung forms a customs district under the Chinese Maritime Customs. There are about 80 miles of railway in operation. In 1912-13, the revenue was 6,162,770 yen, and the expenditure, 5,359,504 yen; for 1914-15, the budget balanced at 4,444,319 yen. Kwantung is administered by a Governor-General, resident at Ryojun.

LABOR. The year 1915 was one of progressive improvement in the conditions of labor in the United States. Even from the principal nations at war there were repeated reports of decrease in unemployment and advances in wages. The radical wing of the labor movement repre-

sented by the Industrial Workers of the World (q.v.) was comparatively quiescent in the United States, while syndicalism had lost complete importance as a radical labor propaganda in Europe and Australia. The year was notable for the unusual number of strikes, some of which are described under **STRIKES AND LOCKOUTS** (q.v.). Toward the close of the year there were many reports of advances in wages. Thus on December 28th at New York City alone increases were announced by street railway companies, contractors in the building trades, employers in the millinery trade, by restaurants and hotel managers, by the Pullman Company, and by the Brooklyn Navy Yard, granting advances to more than 200,000 employees. The following day an announcement of a 5 per cent advance was made for the 75,000 mill workers in principal centres in New Hampshire, Massachusetts, and Rhode Island. Previously there had been substantial improvements for railway employees and for workers in all branches of the iron and steel industry, including numerous cognate industries stimulated by the excessive demand for war supplies. The condition as regards employment is indicated in the article on **UNEMPLOYMENT**. In the article on **TRADE UNIONS** (q.v.) will be found an account of the movement of organized labor in various countries. The industrial problems connected with women and children are treated under **CHILD LABOR**; **MINIMUM WAGE**; **PENSIONS FOR MOTHERS**; and **WOMEN IN INDUSTRY**. Other phases of the labor problem will be found under: **ARBITRATION AND CONCILIATION**, **INDUSTRIAL**; **BOYCOTT**; **CHILD LABOR**; **INDUSTRIAL RELATIONS COMMISSION**; **LABOR**, **AMERICAN FEDERATION OF**; **LABOR LEGISLATION**; **LABOR LEGISLATION, AMERICAN ASSOCIATION FOR**; **OCCUPATIONAL DISEASES**; **OLD-AGE PENSIONS**; **PRICES**; and **WORKMEN'S COMPENSATION**.

BUREAU OF LABOR STATISTICS. The year's history of this bureau was notable for greatly increased activities and new ventures. Among other things the publication of a *Monthly Review* was begun in July, to be issued thereafter on the 29th day of each month. This was to serve as a medium for the dissemination of useful information not readily accessible to the interested public. It summarizes the results of original investigations, labor legislation, court decisions, reports of State and foreign labor bureaus, and gives other information regarding the labor movement. The *Bulletin* of the bureau is published under various series treating respectively the following subjects: wholesale prices; retail prices and cost of living; wages and hours of labor; women in industry; workmen's insurance and compensation; industrial accidents and hygiene; conciliation and arbitration; labor laws of the United States; foreign labor laws; and miscellaneous. Among the notable publications during the year of the *Bulletin*, was No. 3 of the Wholesale Price Series (whole number 173), "Index Numbers of Wholesale Prices in the United States and Foreign Countries," of which part I, pages 5-114, was a complete exposition of the theory of index numbers by Prof. Wesley C. Mitchell.

Among the new subjects of investigation taken up by the bureau were the following: Profit sharing and other forms of gain sharing; administrations of labor and compensation laws; employment bureaus of industrial and mercantile establishments; labor conditions in Hawaii;

and the annual "turnover" of labor. By the last is meant the number of men employed and discharged in the course of a year. The Woman's Division of the bureau has undertaken a study of the effects of accidents resulting in death or disability upon family life, with a view of determining the adequacy of compensation in such cases.

ALIEN LABOR. Numerous efforts have been made by various States to restrict the industrial opportunities of foreigners. Thus in Louisiana an alien is prohibited from securing a contract for public printing; in Michigan he cannot secure a barber's license; in various States he cannot get a liquor license; in six States he is prevented from hunting and fishing for a living; in Wyoming he cannot serve as a guide; in Virginia he cannot become a dealer in junk. But the most notable cases have been those of Arizona and New York laws. The Arizona law, adopted by a referendum vote, required every employer of five or more persons to hire not less than 80 per cent of qualified electors or citizens of the United States. This law was declared unconstitutional by a special circuit court, and in November this opinion was affirmed by the United States Supreme Court. In the opinion written by Justice Hughes it was held that this law was at variance with the 14th amendment in that it denied the equal protection of the laws, this guarantee applying to aliens as well as to citizens. The justice pointed out that the "right to work for a living in the common occupations of the community is of the very essence of the personal freedom and opportunity that it was the purpose of the 14th amendment to secure." One who cannot work in a community cannot live there. This law had been protested by the English and Italian governments, and was being carefully observed by the Japanese in California. It was, however, aimed largely at Mexicans employed in mines and on ranches.

A New York law enacted in 1898 forbade the employment of aliens on public works, and provided that the contracts of those disobeying this prohibition should be forfeited. This law was tested in two cases growing out of subway construction in New York City. It was held constitutional by the local courts, by the Court of Appeals of New York, and finally in November by the United States Supreme Court. The opinion of the Supreme Court declared that any civil authority could prescribe the conditions upon which it would permit public work to be done in its behalf. Such a matter was wholly a question of public policy with reference to which the courts have no authority. This decision temporarily affected subway contracts involving millions of dollars. Notice was given that at least 10,000 men, mostly Italians and Austrians, must be discharged. Moreover, work on the Barge Canal and elsewhere in the State was affected. However, between the decision of the Court of Appeals in February and the Supreme Court decision in November the law had been modified so as to permit employment of aliens when Americans were not available.

KANSAS COERCION LAW. A Kansas statute which forbade an employer to require a workman to sign an agreement not to join a labor union and which had been sustained by the State courts was in February declared unconstitutional by the United States Supreme Court. Similar statutes had been enacted in 13 other

States. The majority opinion held that the statute impaired the liberty of contract guaranteed by the Constitution, destroyed the equality of right enjoyed by employer and employee, and secured no purpose necessary or beneficial to the general welfare. A dissenting opinion written by Justice Day was concurred in by Justice Hughes and Justice Holmes. The opinion occasioned some surprise, inasmuch as the Supreme Court had previously declared that employers and employees do not stand upon an equality since the former lay down the rules and the latter are practically compelled to obey them. It had also previously held that the liberty of contract is not absolute but relative. The dissenting opinion held that instead of the purpose of the statute bearing no relation to general welfare "it would be difficult to select any subject more intimately related to good order and the security of the community than that under consideration—whether one takes the view that labor organizations are advantageous or the reverse."

SEAMAN'S ACT. The Seaman's Act was passed by the Sixty-third Congress in March, 1915, after a struggle of many years on the part of seamen supported by the American Federation of Labor. Andrew Furuseth, president of the International Seamen's Union, was largely instrumental in bringing about this and previous improvements in the laws governing seamen. The specific purposes claimed were to liberate seamen; to promote safety at sea; and to build up an American mercantile marine without the use of subsidies. The law is international in effect since it applies to all vessels touching at American ports. It grants the right of American and foreign seamen to quit service, a right long denied to crews of American vessels in foreign ports, and to seamen on practically all foreign vessels in American ports. An American statute law combined with 20 or more foreign treaties has denied this liberty by holding seamen to terms of contracts which all seamen, under the laws of every nation, are required to sign upon accepting employment. The Seaman's Act repeals this statute and provides for the abrogation of such parts of the treaties as require the arrest and punishment of seamen for what is called "desertion." The act declares that on and after June 4, 1916, for foreign vessels, or as soon as treaties with foreign countries can be abrogated, and Nov. 4, 1915, for American vessels, the seamen shall not be held in compulsory servitude when their ships are within any harbor of the United States or its territories. The law provides a language test for all seamen, and specifies the percentage of able seamen to be carried on all vessels touching American ports. Further provisions include a nine-hour day and no work on Sunday and legal holidays while in port; men shall not be required to work alternately in the flreroom and on deck; a minimum number of lifeboats and liferafts as well as the number of men manning these is specified; ship's officers are not to be considered as fellow servants of seamen, thus facilitating the recovery of damages in case of accident. Further changes in the existing law deal with the manning of inspected vessels, scale of provisions, advance and allotment, shipment in place of deserter, rules for payment of wages, money due in port, mutual release, attachment of wages, discharge in foreign port, better forecastles, survey of vessel, and the prohibition of capital punishment. The most rad-

ical provision of the bill is the one which makes the law applicable to all ships leaving the ports of the United States whether flying the United States flag or not. Advocates of the bill believe this is important because by equalizing conditions of service and operation, it will put other nations on the same footing as the United States and will do more than anything which has yet been attempted to build up an American merchant marine. The scope of the law was greatly restricted by the decision of the Departments of Justice and of Commerce that the safety provisions of the act do not apply to foreign-built ships admitted to American registry under the President's order suspending survey, inspection, and measurement laws, nor to vessels of foreign countries whose navigation laws "approximate" those of the United States.

There was much opposition to the enforcement of the act. The United States Chamber of Commerce, the National Association of Manufacturers, the National Foreign Trade Council, Pacific Mail Steamship Company, and the Robert Dollar Company were among prominent opponents of the act. A vigorous publicity campaign in opposition during the summer was based on the claims of the Pacific Mail Steamship Company and the Robert Dollar Company of California that they were going out of business because the Seaman's Law made it impossible to use Chinese or Japanese crews. Shipowners opposed the law because it would raise wages and otherwise increase the costs of operation, and place the American shippers at a disadvantage. But Secretary of Labor Wilson and Secretary of the Treasury McAdoo in various addresses declared that the Robert Dollar vessels had been transformed to American registry primarily to secure the protection of the American flag during the war, and that the Pacific Mail vessels were transferred to the Atlantic partly because the Panama Canal Act forbade railroads owning competing vessels to operate them through the canal, and partly because the unprecedented demand due to war shipments made the vessels worth much more in the Atlantic than in the Pacific.

GERMAN-AUSTRIAN ACTIVITIES. Extensive and varied efforts were made by agents of the German and Austrian governments to foment strikes and otherwise prevent the manufacture of war supplies and their shipment to Europe. It was on this account that the United States government officially requested the recall of Ambassador Dumba. The seizure of correspondence found in the cabin of James E. J. Archibald, an American citizen, when the liner *Rotterdam* touched at Falmouth, England, showed that Dumba had engaged in such conspiracies. He wrote, "We can disorganize and hold up for months, if not entirely prevent, the manufacture of munitions in Bethlehem and the Middle West, which, in the opinion of the German military attaché, is of great importance, and amply outweighs the expenditure of the money involved." He defended himself for entertaining such a proposition, in a letter to Secretary of State Lansing, by saying that he was looking after the interests of Austro-Hungarian subjects who were laying themselves open to persecution by their home government for the aid they were rendering the Allies through their work in American munitions factories. Together with the letters of Dr. Dumba were others written by Captain von Papen, the military attaché of the Ger-

man Embassy. These letters dealt mainly with the attempts of German agents to prevent American firms from embarking on the supply of war material or the effort to induce such firms to acquiesce in the non-fulfillment of contracts and the non-delivery of contracted material.

Another extensive conspiracy was that involving Captain Franz von Rintelen, who was a leading German secret service official, commissioned either to foment labor disturbances or to bring about an invasion of Mexico by the United States. He attempted both. He had apparently unlimited credit and financed an organization known as Labor's National Peace Council. This organization was formed ostensibly to carry out neutral purposes, and at first enlisted the support of distinguished American labor leaders. Mr. Samuel Gompers, president of the American Federation of Labor, however, early resigned as first vice-president of the Council, charging that it was being used as a shield by agents of the German government in their propaganda against the export of munitions. On December 28th, eight men were indicted by the Federal Grand Jury at New York for conspiracy to prevent the manufacture and shipment of articles needed in warfare from this country to Great Britain and her allies. These indictments were the first handed down for instigation of strikes and attempts to obstruct the manufacture of munitions, this jury having been in session since September. A new grand jury was sworn in to take up the work. The men indicted were: Franz von Rintelen, who at the time was a prisoner in England; Rep. Frank Buchanan of the Seventh District of Illinois, a former head of the Council; Robert Fowler, former Congressman from the 24th district of Illinois and a lawyer for the Council; Frank S. Monnett, ex-Attorney-General of Ohio, also connected with the Council; David Lamar, known as the "Wolf of Wall Street"; Jacob C. Taylor, Buchanan's successor as president of the Council; Henry B. Martin, secretary of the Council; and Herman Schulteis, also identified with the Council. Under the section of the Sherman Anti-Trust Law under which these indictments were returned the men if found guilty can be sent to prison for one year or fined \$5000 or both. In addition to the hampering of the manufacture of munitions, the prevention of shipment, and the instigation of strikes, the indictment alleged a publicity campaign.

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LABOR, AGRICULTURAL. See AGRICULTURE, *Agricultural Labor*; AGRICULTURAL LEGISLATION; and CHILD LABOR.

LABOR, AMERICAN FEDERATION OF. Founded in 1881, this has become the largest and by far the most influential organization of workers in

the United States, and one of the largest in the world. It is composed of affiliated bodies which are primarily organized on the basis of trades or crafts, though some of its largest constituents, notably the United Mine Workers of North America and United Brewery Workers, are organized so as to include all trades in the industry. The federation carries out the principles of individual trade union autonomy in so far as such a policy does not interfere with the interests of the labor movement in general. It has during recent years manifested marked hostility to Socialism, syndicalism, the I. W. W., and other radical labor movements; and it has repeatedly pronounced itself against all forms of violence during strikes and labor disputes. For a number of years it has carried on a vigorous campaign to secure the limitation of the power of the courts to issue injunctions during labor disputes. This resulted in the inclusion in the Clayton Anti-Trust Law of 1914 of sections declaring that "the labor of a human being is not a commodity or article of commerce," and guaranteeing certain rights in connection with organization and the use of the boycott (q.v.). It was largely instrumental in securing the passage of the Seaman's Act (see under LABOR). It has steadfastly refused affiliation with any political party.

Among its most important constructive activities in 1915 were its practical efforts to reduce the evils of unemployment. It favored the increase of compensation for fatal injuries to 66% per cent of wages in place of the usual 50 per cent provided by most laws, an extension of the period of compensation, compensation for widows during widowhood, and the complete elimination of private employers' liability companies. It continued its opposition to certain phases of scientific management, especially physical examinations, the use of stop watches, and all systems of speeding up the workers. It strongly advocated industrial education and trade training; a weekly rest day with a Saturday half holiday; public employment agencies; the abolition of the contract system for public work; the abolition of sweat shops; sanitary inspection of factories, mines, and homes; public ownership of municipal utilities and of telephone and telegraph lines; old age pensions for all civil service employees; minimum wage laws; and the prohibition of interstate shipment of convict-made goods.

Its annual convention was held at San Francisco in November. The principal matters under discussion were the war, unemployment, industrial unionism, and the eight-hour day. For several years efforts have been made in each annual convention to commit the body to the principle of industrial unionism. While the coal miners, brewery workers, metal miners, and machinists have already gone far in the direction of organization on the basis of industry, the convention has consistently voted against the proposal. A considerable faction of the Federation favors the enactment of eight-hour laws applicable to all industries. The defeat of such legislative proposals in California and Washington in 1914 was partly due to the fact that President Samuel Gompers of the Federation had repeatedly declared opposition to securing an eight-hour day by legislative enactment. While the Federation has been largely responsible for the enactment of laws requiring the eight-hour day on

public works, a resolution in the 1915 convention favoring the legislative method of securing an eight-hour day in private employment was voted down by a considerable majority. The convention voted down resolutions protesting against military training in the schools. As to unemployment, it was resolved to urge municipalities to provide food and shelter for men out of work and to appoint a committee to investigate unemployment and vagrancy. It was voted to ask each of the 2,000,000 members to devote one hour's wage on January 27th, President Gompers's birthday, to the relief of the Danbury Hatters (see *BOYCOTT*). The report of the Industrial Relations Commission (q.v.) was warmly endorsed: the restriction of immigration by a literacy test was favored; and it was resolved to put forth greater efforts to organize migratory, casual, and unskilled labor.

The Federation in 1915 was composed of 110 national and international unions, with about 22,000 local bodies. There are five major departments, namely, building trades, metal trades, union label, mining, and railroads. It has 44 State branches, 631 city central bodies, and 485 local unions not belonging to national or international organizations. The paid membership slightly exceeds 2,000,000, and its 1715 organizers work under the slogan "now for the three million mark." It publishes the *American Federationist*, a monthly; and the affiliated unions publish about 540 weekly or monthly papers. Its headquarters are at 801-809 G Street N. W., Washington, D. C. President, Samuel Gompers; secretary, Frank Morrison; and treasurer, John B. Lennon.

LABOR, DEPARTMENT OF. See section so entitled under *ARBITRATION AND CONCILIATION*.

LABOR EXCHANGES. See under the article *UNEMPLOYMENT* the paragraphs on *Public Employment Exchanges*.

LABOR LEGISLATION. During 1915 legislative bodies met in all the States except Kentucky, Maryland, and Mississippi, and while the volume of labor legislation was considerable, it was not unusually great, nor did it take novel forms nor new directions. In addition to the classified statement below the reader should consult *ARBITRATION AND CONCILIATION*; *CHILD LABOR*; *INDUSTRIAL RELATIONS COMMISSION*; *MINIMUM WAGE*; *OLD AGE PENSIONS*; *TRADE UNIONS*; *UNEMPLOYMENT*; *WOMEN IN INDUSTRY*; and *WORKMEN'S COMPENSATION*.

ADMINISTRATION. By far the most notable improvement in administrative organization was that taken in the creation of the New York State Industrial Commission. This type of organization had been established first in Wisconsin, and in 1915 was also adopted with slight modifications in Colorado and Montana. The New York Commission is composed of six commissioners, of whom John Mitchell is chairman. There is in addition an industrial council of 10 members, five of whom represent employers and five of whom represent employees. This council serves in a purely advisory capacity to the Industrial Commission, and serves without either salary or expenses. The work of the commission combines the activities previously carried on by the following bodies: The State Labor Department, the Workmen's Compensation Commission, and the State Insurance Fund, the State Bureau of Mediation and Arbitration, the State Bureau of Inspection, the State Bureau of Industrial Hy-

giene, the State Bureau of Labor Statistics and Information, the State Information Bureau, and the State Bureau to Formulate an Industrial Code. All of these bodies had branch offices in New York, Buffalo, Rochester, and Syracuse, and the commission maintains branches in the same cities, as well as in Utica. The organization includes three deputies, respectively in charge of inspection, of compensation, and of mediation and arbitration. This consolidation and unification of all branches of the labor department is expected to eliminate waste and duplication, and increase efficiency. In October the commission began the issue of the *Bulletin*—to be published monthly and to contain information regarding the activities of its different departments. The Colorado Commission does not displace existing administrative bodies, but was superimposed on them as an investigating, supervising, and rule-making authority. In Montana a newly created Industrial Accident Board was given extensive authority not merely over safety and workmen's compensation, but over every industry and place of employment: it may formulate rules and give any order deemed advisable in the interest of safety. Indiana and Nevada likewise provided for the administration of the compensation and the labor laws by one body; and in New Jersey the Bureau of Labor Statistics was merged with the Department of Labor. Connecticut changed the offices of Factory Inspector and Commissioner of the Bureau of Labor Statistics into the Department of Labor and Factory Inspection. The powers of the commissioner of the Bureau of Labor Statistics in California were greatly expanded: he was authorized to appoint two deputies, and an assistant deputy to reside at Los Angeles; and to open offices at San Francisco, Los Angeles, Sacramento, and San Diego. The California Legislature also declared labor camps not conforming to regulations, nuisances which may be abated by order of the Commissioner of Immigration and Housing. Delaware likewise authorized a cannery inspector to close any cannery violating the law until needed changes are made; upon a third offense the cannery may be closed by court order and reopened only at the discretion of the court.

MINES. Laws relating to labor in mines were enacted in 12 States and 1 Territory. In Alaska a detailed mine safety code was enacted. Laws were merely amended in Colorado, Idaho, Illinois, Kansas, Missouri, Nevada, New Mexico, Pennsylvania, Tennessee, and Texas; but West Virginia not merely rewrote her code but enacted important additions including the creation of a Bureau of Mine Research at the State University. Arizona created a Bureau of Mines for purposes of investigation, but without administrative authority. Illinois authorized a commission to investigate mines and report on revision of laws relating to coal mines; and Indiana created a commission to codify mining laws and suggest amendments. Pennsylvania permitted mine owners to employ unlicensed mine foremen, but made all mine foremen and fire bosses agents of the owners under the liability laws.

WAGES AND HOURS. Seven States and Alaska enacted laws relating to the hours and wages of labor, not including laws relating to the employment of women and children, and mothers' pensions. California fixed an eight-hour day for laborers on work for public utility districts, and Oregon excepted State departments from the

eight-hour law for public works. Alaska prescribed an eight-hour day for placer miners, thus placing them on the same basis as other miners in the Territory. Iowa required railroad companies to pay their employees twice each month; Kansas applied a similar law to all corporations, except civil, and Pennsylvania to most civil authorities; Minnesota required public utility corporations to pay wages twice a month, and prescribed penalties in cases of the non-payment of wages by contractors; California required semi-monthly payment in cash or its equivalent by all public authorities and by all employers having at least six employees; and Texas required all corporations employing over 10 persons, and contractors on public works, to pay wages semi-monthly out of current installments paid for improvements on real estate. New York limited the hours of labor in grocery stores to 70 per week for persons above the age of 16 years, 11 hours on five days and 15 on Saturday. North Carolina required railroads to pay shop employees semi-monthly. South Carolina provided penalty for failure to pay wages due employees when discharged; and forbade the discounting of employees' trade or pay checks; and Florida required employers to redeem store orders in money. Utah enacted a law fixing six P.M. as the hour of closing for all commercial and mercantile houses except drug stores and dealers in perishable foods.

SPECIAL LAWS. Among the enactments not readily classified may be mentioned the New Jersey law authorizing street and water commissions in cities of the first class to establish contributory pension systems for their employees. A New York law forbidding the employment of aliens on public works was so amended as to make such employment legal, though citizens must be preferred if available. (See under LABOR.) South Carolina required the segregation of races in textile factories. Another South Carolina statute prohibited tipping. West Virginia increased the number of mine inspectors and enlarged their powers. Laws increasing safety and sanitary regulations were enacted in Connecticut, California, Massachusetts, Missouri, Illinois, and South Carolina. Thus Connecticut required the establishment of first aid rooms or emergency kits in all manufacturing establishments; California required the provision of pure drinking water; Illinois passed detailed regulations regarding heating, lighting, ventilation, and the guarding of machinery. Missouri passed similar provisions for coal and zinc mines, and required the installation of wash rooms with separate rooms for negroes. Massachusetts required the installation of first aid appliances.

FINLAND. The general law for the protection of factory workmen enacted in 1914 becomes effective Jan. 1, 1916. The law is applicable to factories, building operations, construction work on railways, canals, harbors, and bridges, and agricultural work where machines driven by power are used. It contains provisions regarding light, ventilation, and heating; fire escapes and protection against dangerous machinery; and requires an air space of at least 353 cubic feet for each workman. Labor inspectors are authorized to require the provision of suitable lunch rooms for workmen at meal time. The Imperial Senate is required to draw up a list of dangerous trades, and issue regulations therefor. This section also provides for the regula-

tion of the labor of women and children. It was expected that the law would require the increase in the number of inspectors from two to eight.

LABOR LEGISLATION, AMERICAN ASSOCIATION FOR. This American branch of the International Association for Labor Legislation has established branches in most of the industrial States and has won prestige in the advancement of legislation for the improvement of industrial conditions. Its headquarters are at 131 East 23d St., New York City; its president, Prof. Henry R. Seger of Columbia University; and its secretary, John B. Andrews. It publishes the *American Labor Legislation Review*, a quarterly, the fifth volume of which was issued in 1915. During the past year it devoted its attention primarily to the problems of unemployment and workmen's compensation. With reference to unemployment, as the result of investigations in 115 different communities covering 300 organizations and individuals dealing with the extremely critical problem of unemployment in the winter of 1914-15, it formulated a set of "Standard Recommendations" as follows: (1) A permanent community organization, preferably a committee appointed by the mayor and including all classes concerned, should be brought into existence in each industrial centre. (2) A persistent campaign of education should be carried out to inform every citizen on all aspects of unemployment. (3) Every possible effort should be made to supply employment at standard rates on part-time before such emergency measures as bread lines, bundle days, or soup kitchens are resorted to. (4) The unemployable should be differentiated from the unemployed and special facilities provided for the sick, the mentally defective, the aged, the vagrant, the inefficient, and the handicapped. (5) Industrial training classes for unemployed workers should be organized. (6) A centrally located and amply financed employment exchange should be organized. (7) Public work providing especially for resident heads of families at usual hours and wages should be undertaken during critical periods. (8) Private employers should be urged to regulate their demand for labor, taking advantage of slack periods to carry out repairs and improvements. (9) Compulsory unemployment insurance should be provided by contributions from employers, employees, and the State.

LABOR STATISTICS, BUREAU OF. See OCCUPATIONAL DISEASES, section so entitled.

LABRADOR. A peninsula in the northeastern part of British America. Except a strip along the coast, which belongs to Newfoundland, it is included in the Canadian Province of Quebec.

LABUAN. See STRAITS SETTLEMENTS.

LAFAYETTE COLLEGE. An institution for higher education, founded in 1832, at Easton, Pa. The total enrollment in all departments in the autumn of 1915 was 612. The faculty numbered 54. John H. MacCracken, LL.D., was installed as president of the university in 1915. Prof. A. K. Hackell, Ph.D., was appointed professor of history and dean of the college, in place of Prof. Allen Roberts, resigned. Prof. Alvin Davidson died in 1915, and Prof. F. Kunkel, Ph.D., was appointed professor of biology to succeed him. Prof. William H. Smith, Ph.D., was appointed professor of mathematics and registrar in place of Prof. J. J. Hardy, who died. The productive funds amounted, at the end of

the fiscal year, to \$620,128. The library contained 41,292 volumes.

LA FOLLETTE SEAMEN'S LAW. See SHIPPING.

LAGERLOF, SELMA. Her novel *The Emperor of Portugal*. See SCANDINAVIAN LITERATURE, *Swedish Fiction*.

LAKE MOHONK CONFERENCE. See INTERNATIONAL ARBITRATION AND PEACE.

LAKE WASHINGTON CANAL. See CANALS.

LAMPRECHT, KARL. Distinguished German historian, died at Leipzig, on May 12, 1915. He was born at Jessen on Feb. 25, 1856, and was educated at the universities of Göttingen, Leipzig, and Munich. He became professor at the University of Bonn in 1885, at Marburg in 1890, and at Leipzig in 1891. His works include: *Beiträge zur Geschichte des französischen Wirtschaftslebens im elften Jahrhundert* (1878); *Deutsches Wirtschaftsleben im Mittelalter* (1886); *Die römische Frage von König Pipin bis auf Kaiser Ludwig den Frommen* (1889); *Die kulturhistorische Methode* (1900); *What is History?* (1905), written after a visit to the United States; and his famous *Deutsche Geschichte* (13 vols., 1891-1908), a work based on the theory that history is not primarily political, but is chiefly concerned in tracing the unfolding of the "social soul," a task which necessitates a social-psychological point of view. Lamprecht's *History of Germany* made a deep impression and aroused much opposition, his chief opponent being Dietrich Schäfer. He was rector of the University of Leipzig in 1910-11, and received honorary degrees from Columbia University, the University of Christiania, and the University of St. Andrews. In 1882 he founded *Die westdeutsche Zeitschrift für Geschichte und Kunst*, and after 1904 was in charge of Heeren and Ukert's *Allgemeine Staatengeschichte*. In his behalf the University of Leipzig established an Historical Institute, with facilities unrivaled in Europe. As chief exponent of the so-called *Kulturgeschichte* he was an ardent believer in the rightful supremacy and claims of German *Kultur*, and he engaged in controversies on questions concerning the great war. He vigorously contended that the war was a conflict with which not only the Kaiser and the German military caste, but the whole German people, were in full sympathy, and for which they were alike responsible; and a few months before his death he wrote a letter to that effect to Dr. Charles W. Eliot and Dr. Nicholas Murray Butler.

LAMPS, ELECTRIC. See ELECTRIC LIGHTING.

LANDSCAPE GARDENING. See CITY PLANNING.

LANDS, PUBLIC. The total area of public and Indian lands originally entered and allowed during the fiscal year ended June 30, 1915, was 16,861,214 acres, an increase of 338,362 acres, as compared with the area entered during 1914. The area patented during the fiscal year was 13,025,427 acres, a decrease of 1,365,643 acres, as compared with the fiscal year 1914. Of the above area, 9,594,973 acres were patented under the Homestead laws, and 32,360 acres were patented as soldiers' additional entries.

The total cash receipts for the sale of public land, including fees for the fiscal year 1915, was \$3,786,319, compared with \$4,256,102 in 1914.

During the year 56 withdrawals for power site

preserves covering an area of 292,134 acres were made. Applications for withdrawals covered 1,048,654 acres, compared with 315,209 acres in 1914.

Radical changes were made in the regulations under which the desert-land entries are allowed. Applications are now referred for a field examination as to feasibility prior to final action. For the relief of those who might make entries, but could secure no adequate water supply, Congress passed remedial legislation in 1915. During the fiscal year 2711 desert-land entries were patented, embracing 488,752 acres, compared with 2127 desert-land entries, embracing 346,794 acres in 1914.

LANGLOTZ, CARL A. American educator and musician, died Nov. 25, 1915. He was born in Germany in 1833, a son of a musician at the Court of Saxe-Meiningen. He was educated at the Gymnasium Bernhardinum. He also studied music at Weimar. When Wagner conducted the first production of *Lohengrin*, Professor Langlotz was a member of the orchestra. He removed to the United States and opened a studio in Philadelphia. In 1856 he became a member of the faculty of Princeton University as a teacher of German. In 1859 he composed the melody for "Old Nassau," a prize poem, written for the *Nassau Literary Magazine* by Harlan Page Peck. In the course of years it has obtained great popularity, and is now recognized as the anthem of the university. Professor Langlotz was the only survivor of the Princeton faculty of fifty years ago.

LANGIVAN, LOUIS PHILIP. Canadian Archbishop, died June 15, 1915. He was born at St. Isador, Quebec, in 1855. In 1881 he joined an order of oblates, and in 1882 was ordained a priest. He served for a time as a professor in the Catholic College at Ottawa. He was made bishop of St. Boniface, Manitoba, in 1895. In 1908 he completed the construction of a new cathedral.

LANSING, ROBERT. American Secretary of State by appointment of President Wilson on June 23, 1915. He was born in Watertown, N. Y., in 1864, and in 1886 graduated from Amherst College. After studying law he was admitted to the bar in 1889, and for several years practiced at Watertown. In 1902-03 he acted as associate counsel for the United States in the Behring Sea Arbitration, and was counsel for the American government in the Behring Sea Claims Commission in 1896-97. In 1903 he was solicitor for the United States in the Alaskan Boundary Tribunal, and was counsel in the North Atlantic Coast Fisheries Arbitration of The Hague in 1909-10. He acted as agent for the United States in the American and British Claims Arbitration in 1914 and 1915. On March 20th of the latter year he was appointed counselor for the Department of State to succeed John Bassett Moore, who resigned. In addition to his work for the United States government, Mr. Lansing was in 1894-95 counsel for the Mexican and Chinese litigation in Washington. For an account of Mr. Lansing's work in the State Department in 1914-15, see articles *UNITED STATES, Government*; and *UNITED STATES AND THE WAR*.

LAOS. The largest of the territories composing the dependency of French Indo-China. Capital, Vientiane. Luang Prabang, Bassac, and Muong Sing (three protected states) are in-

cluded under Laos. Teak is cut in the forests and agriculture and mining are carried on. See *FRENCH INDO-CHINA*.

LARD AND LARD SUBSTITUTES. See *FOOD AND NUTRITION*.

LAROSAN, also known as **STOELTZNER'S CASEIN CALCIUM**. Larosan is prepared by treating a watery suspension of casein with calcium hydroxide in such quantities as will yield a solution neutral to phenolphthalein, and then evaporating to dryness. It occurs as a light, white, nearly odorless and tasteless powder, and has a calcium equivalent of 2.5 per cent of calcium oxide. It is indicated in the diarrhoeal diseases of infants and wherever it becomes necessary to introduce calcium into the body tissue.

LASSEN PEAK. See *VOLCANOES*.

LAW, BONAB. See *GREAT BRITAIN, History*.

LAWN TENNIS. The European war prevented the holding of any international lawn tennis matches in 1915, but in the United States the sport flourished as never before. The sensation of the year was the playing of William M. Johnston of San Francisco, a youth barely out of his teens. During the early part of the season Johnston attracted little attention, as he went down to defeat before several players of comparatively mediocre ability. His entry in the All-Comers' tournament on the courts of the West Side Tennis Club at Forest Hills, L. I., therefore, was practically unnoticed by close followers of the game.

R. Norris Williams, 2nd, the national champion of 1914, and Maurice E. McLoughlin, who had lost the title to Williams, were the logical favorites when play in the All-Comers' started. Karl Behr, who had defeated McLoughlin in a previous tourney, also was regarded as a possible winner.

No upsets occurred until the fourth round was reached, when Johnston sprang into the limelight by conquering Behr in a hard-fought four-set match. Williams and McLoughlin, in the meantime, had mowed down their opponents with ease.

Clarence J. Griffin was the next to bow to the skill of Johnston, going down to defeat after five thrilling sets. This victory gave Johnston the right to meet Williams in the following round.

Williams won the first set at 7-5 after capturing six games in a row and it appeared as though his youthful opponent was hopelessly outclassed. The second set, however, told a different story, for Johnston rallied strongly and emerged victor at 6-4. Williams took the third set at 7-5.

Then came the rest period. Johnston returned to his task with a fierceness that carried Williams off his feet, and won the fourth set at 6-2. The fifth and last set found Williams utterly bewildered by the vicious speed shown by his rival, who was again victorious by the same score, 6-2.

In the final round McLoughlin took the first set easily at 6-1, Johnston appearing unable to get going. The complexion of things changed in the second set when Johnston smashed his way through without giving his opponent a single game. In both the last two sets McLoughlin gained early leads only to weaken before the vigorous attack he was obliged to face, Johnston winning at 7-5 and 10-8.

Johnston scored another triumph in the double

matches, where, teamed with Griffin, he wrested the title from McLoughlin and Thomas C. Bundy.

The United States National Lawn Tennis Association, in its official ranking for the year, placed Johnston at No. 1, Williams at No. 2, and McLoughlin at No. 3. Others to win places among the first ten were, in order: Karl Behr, Theodore R. Pell, N. W. Niles, C. J. Griffin, W. M. Washburn, G. M. Church, and W. M. Hall.

No summary of the year in lawn tennis would be complete without mention of the brilliant playing of Miss Molla Bjurstedt, of Christiania, Norway, who won the national indoor title, the national championship, the metropolitan championship, and the national clay court title.

After making practically a clean sweep on the Eastern courts, Miss Bjurstedt went to the Pacific Coast, where she met Mrs. Thomas C. Bundy, Mrs. George W. Wightman, Miss Mary Browne, and Miss Florence Sutton. In all of these special matches Miss Bjurstedt was successful save for those with Mrs. Bundy, who defeated her twice and lost to her once.

It will be noticed that the All-Comers' tournament was held at Forest Hills, L. I., instead of at Newport, which for 34 years had been the "capital" of the United States lawn tennis world. The change was due to the campaign waged by Karl Behr and other prominent players who contended that this national fixture should not be restricted to any one club.

A summary of the principal tournaments in the United States follows:

All-Comers' National, at Forest Hills. Men's singles, final round, W. M. Johnston defeated M. E. McLoughlin, 1-6, 6-0, 7-5, 10-8; men's doubles, challenge round, W. M. Johnston and C. J. Griffin defeated M. E. McLoughlin and T. C. Bundy, 2-6, 6-3, 6-4, 3-6, 6-3.

Women's National, at Philadelphia. Singles, final round, Miss Molla Bjurstedt defeated Mrs. G. W. Wightman, 4-6, 6-2, 6-0; doubles, final round, Mrs. Wightman and Miss Sears defeated Mrs. M. McLean and Mrs. G. M. Chapman, 10-8, 6-2.

Clay Court, at Pittsburgh. Singles, final round, R. N. Williams, 2nd, defeated G. M. Church, 7-5, 6-3, 2-6, 8-6; doubles, final round, G. M. Church and Dean Mathey defeated R. N. Williams, 2nd, and W. M. Washburn, 6-3, 6-3. Women's singles, final round, Miss Molla Bjurstedt defeated Mrs. G. M. Wightman, 3-6, 6-1, 6-3.

National Indoor, at New York City. Singles, final round, G. F. Touchard defeated A. M. Lovibond, 6-3, 6-2, 3-6, 6-2; doubles, final round, G. F. Touchard and W. M. Washburn defeated T. R. Pell and K. H. Behr, 7-5, 3-6, 3-6, 6-2, 6-3.

Women's National Indoor, at New York City. Singles, final round, Miss Molla Bjurstedt defeated Miss Marie Wagner, 6-4, 6-4; doubles, final round, Mrs. Marshall McLean and Mrs. S. F. Weaver defeated Miss Molla Bjurstedt and Miss Florence Ballin, 3-6, 8-6, 6-2.

Panama-Pacific Exposition, at San Francisco. Men's singles, final round, M. E. McLoughlin defeated W. M. Johnston, 7-9, 4-6, 8-6, 6-2, 6-4; men's doubles, final round, W. M. Johnston and J. R. Strachan defeated G. M. Church and Dean Mathey, 6-2, 2-6, 7-5, 6-1. Women's singles, final round, Miss Anita Myers defeated Miss Marjorie Wale, 6-4, 6-2.

Intercollegiate, at Philadelphia, Pa. Singles, final round, R. N. Williams, 2nd, Harvard, defeated Leonard Beekman, Princeton, 6-2, 6-1, 6-2; doubles, final round, R. N. Williams, 2nd, and R. Harte, Jr., Harvard, defeated Caner and Curtis, Harvard.

Interscholastic, at Forest Hills, L. I. Singles, final round, H. A. Throckmorton, Woodbridge High School, N. J., defeated C. S. Garland, Edgewood High School, N. J., 6-3, 7-5, 2-6, 6-3.

Metropolitan. Men's singles, final round, W. M. Washburn defeated Robert Le Roy, 6-1, 6-3, 7-5; doubles, final round, H. H. Hackett and W. M. Hall defeated A. M. Lovibond and J. H. Steinkampf, 10-8, 6-3, 6-0. Women's singles, final round, Miss Molla Bjurstedt defeated Mrs. Barger Wallach, 6-3, 6-1; doubles, final round, Mrs. Marshall McLean and Mrs. Miles defeated Miss Bjurstedt and Miss Florence Ballin, 6-2, 6-1.

LAW SCHOOLS. See UNIVERSITIES AND COLLEGES.

LEAD. The output of refined lead produced in the United States from domestic ores in 1914 was 512,794 short tons, valued at \$39,997,932, a gain of 100,916 tons in quantity, and \$3,752,668 in value over 1913. The largest contribution made by the States was by Missouri, 194,275 tons, a gain of 41,845 tons. Idaho ranks second, gaining in 1914 40,025 tons. The lead mines of Utah also showed a considerable gain during the year. The world's production of lead in 1913 was 1,270,458 short tons. Next to the United States, Spain produced the largest quantity—223,767 tons. Germany produced 199,627, and Australia 127,867. The total value of the lead imported in 1914 was valued at \$504,978. The exports amounted to 58,722 short tons, valued at \$4,501,674.

With the great demand for lead due to the war, both the production and the export of this metal in the United States showed a great increase in 1915 over 1914. The output of American lead refineries, which included lead obtained both from foreign and domestic sources, was estimated at more than 600,000 tons in 1915 by the *Engineering and Mining Journal* of New York, the production being distributed as shown in the accompanying estimates from the same authority. The total exports of lead from the United States for 1915 were estimated at 119,000 tons, of which 43,000 tons approximately were derived from lead of foreign origin, as compared with 31,051 tons in 1914. The ore and base bullion imported into the United States for refining comes chiefly from Mexico and Chile. The prices for lead in New York progressively increased during the year, reaching in June, 5.932 per pound, from which there was a slight recession, and then a recovery in December, so that at the close of 1915 lead stood at 5.50, compared with 3.729 at the beginning of the year.

See METALLURGY.

PRODUCTION OF LEAD (REFINERY STATISTICS)*
(*Engineering and Mining Journal*, New York)

	1912	1913	1914	1915
Domestic: Class				
Desilverized	286,207	261,616	818,697	817,468
Antimonial	9,239	16,345	17,177	24,370
S. E. Missouri	145,866	133,203	177,413	197,427
S. W. Missouri ...	19,224	22,312	25,448	26,096
Totals	410,036	433,476	538,735	565,356

	1913	1913	1914	1915
Foreign:				
Desilverized	82,715	54,774	28,475	47,405
Antimonial	5,003	2,800	1,119	2,492
Totals	87,718	57,074	29,594	49,897
Grand totals ..	497,754	490,550	568,829	615,253

* These figures include the lead derived from scrap and junk by primary smelters.

LEAD POISONING. See OCCUPATIONAL DISEASES.

LEARNED, WALTER. American banker and author, died Dec. 12, 1915. He was born in New London, Conn., in 1847, and received a high school education. For nearly his entire life he was engaged in the banking business. He was a director and official in several important financial institutions. As an author his chief volumes were translations of the works of François Coppée, and a volume of verses entitled *Between Times*, published in 1899. He was a contributor to several magazines, and was editor of the *Treasury of Famous Poems* (1891) and the *Treasury of Favorite American Poems* (1897). He was a member of many societies and associations.

LEATHER. The leather business in the United States during 1915 experienced unusual conditions on account of the European war, while in the European countries themselves the entire industry was disorganized and for the most part under government supervision. American authorities were unanimous in considering the leather industry dull and depressed. The prices constantly increased during the year, reaching a record point of 27 cents for packer calfskins, though a slight reaction was manifested late in the year. War orders took largely from the stock of heavy leather for military shoes and harness, and it was impossible to obtain from abroad many materials once imported. In fact, America exported the very same materials that once it had secured from foreign markets. Great Britain imported great quantities of sole, upper, and belting stock, as the tanneries were turned over to the military

authorities for the manufacture of boots and shoes and harness. Towards the end of the year there was a more general revival of business, and stocks of leather were at low ebb. In some European countries embargoes were laid on hides and skins, but South American cattle skins were in good supply. Goat skins, colt skins, calf skins, and horse hides were scarce, while heavy leather was in considerable demand. Tanneries experienced difficulty on account of the limited supplies of tanning materials and chemicals. The prices for dyes, and in fact all raw materials, advanced so that a correspondingly high price was asked for the finished product. There was a scarcity of tanning extracts, leading to an increased cost of tanning, and during the year there was to be noticed an increased use of substitutes for leather, this being developed and made of better quality with the demand, especially for motor vehicles. The German dyestuffs and continental calf skins have been cut off entirely, and at the end of the year it was recognized that not only were hides high, but would probably appreciate in value. Foreign competition was eliminated from the American leather market and exports of leather products had been large to the British colonies, South America, South Africa, East Indies, and the Dutch East Indies. In Switzerland the Federal government expressed its intention of commandeering all tanning materials, while in Germany it had become necessary for the government to regulate the prices of such chemicals and other tanning materials which had gone up, especially the imported. The War Leather Company regulated almost the entire hide, leather, and shoe industry of Germany, and also controlled the bark question. For these materials the maximum price was to be fixed by the government authorities. In Austria a maximum price had been fixed by the government on calf as well as other kinds of leathers, and shoe manufacturers in Hungary were expressing their inability to meet the hard conditions involved in filling government contracts. The French government reduced the weight of calf skins that might be exported.

AVERAGE PRICES OF HIDES IN THE UNITED STATES

		PACKED HIDES										
Packer Hides		Heavy Native Steers	Butts	Heavy Texas Steers	Light Texas Steers	Colorado Steers	Heavy Native Cows	Light Native Cows	Branded Cows	Native Bulls	Branded Bulls	Average Prices
Average,	1915.....	24.26	21.87	21.48	21.12	20.89	23.55	22.97	20.90	19.24	16.89	21.167
"	1914.....	19.76	18.56	19.23	18.77	18.20	18.94	19.27	18.49	16.20	15.15	18.25
"	1913.....	18.88	17.42	18.06	17.72	17.26	17.28	17.27	17.19	14.82	13.80	16.920
"	1912.....	17.69	16.17	16.58	16.14	15.88	16.40	16.30	15.71	14.07	12.03	15.697
"	1911.....	14.81	13.50	14.32	13.54	13.47	13.87	13.50	12.56	12.11	10.50	13.218

		COUNTRY HIDES										
Country Hides		No. 1 Heavy Steers	Country Pkr. Brd. Flat	No. 1 Heavy Cows	Country Brd. Flat	No. 1 Bufs	No. 1 Extremes	No. 2 Bufs	Bulls Flat	No. 1 Calf-skins	No. 1 Kips	Average Prices
Average,	1915.....	19.67	18.62	19.06	16.18	18.98	16.65	17.92	15.90	21.60	19.60	18.718
"	1914.....	16.56	16.34	16.42	14.53	16.63	17.70	15.64	13.98	21.90	19.26	16.89
"	1913.....	15.89	14.43	15.00	13.54	15.05	15.60	14.81	12.73	17.18	16.74	14.997
"	1912.....	14.25	13.12	14.06	12.38	14.05	14.91	13.02	11.22	16.60	16.01	14.157
"	1911.....	12.24	10.72	11.82	10.02	11.82	12.80	10.79	10.01	16.34	13.23	11.979

In August a maximum of 27.19 for heavy native steer hides was attained, while the average prices for 1915 were the highest on record in the United States.

EMPLOYERS' LIABILITY and WORKMEN'S COMPENSATION, laws relating to banks and banking under BANKING, and the principal measures relating to railway under RAILWAYS. In this arti-

LIVE STOCK SLAUGHTER AT PRINCIPAL POINTS FOR YEAR ENDING DECEMBER, 1915-1914

	Cattle		Calves		Sheep		Hogs	
	1915	1914	1915	1914	1915	1914	1915	1914
Chicago	1,881,049	1,480,770	411,879	349,905	3,252,010	4,105,081	6,519,125	5,327,454
Kansas City	851,823	925,899	88,202	103,604	1,193,862	1,511,996	2,113,780	1,880,178
Omaha	682,529	528,898	.....	.....	1,898,916	1,875,092	2,012,259	1,927,954
St. Louis	823,089	784,495	.....	.....	576,176	696,846	1,600,878	1,569,524
St. Joseph	246,111	204,837	20,972	22,345	614,608	651,901	1,523,563	1,572,674
Fort Worth	267,439	481,483	94,421	139,484	201,220	295,689	391,408	462,862
Indianapolis	141,550	148,775	88,974	88,096	40,070	62,952	1,495,711	1,312,406
Oklahoma City	119,632	185,015	12,371	20,291	41,149	21,628	475,352	418,179
Wichita	67,386	73,075	.....	.....	18,912	18,099	471,164	411,906
Sioux City	222,955	148,161	21,237	15,847	209,595	314,307	1,189,202	1,027,448
Totals	5,303,513	4,860,908	678,056	689,572	8,046,518	9,548,591	17,791,937	15,860,585
Increase	442,605	.....	.....	.....	.....	.....	1,931,852	.....
Decrease .....	.....	.....	11,516	.....	1,502,073	.....	.....	.....
Wichita, St. Louis and Omaha count calves as cattle.								

LEEWARD ISLANDS. A British colony; the most northerly group of the (British) Lesser Antilles. The five constituent presidencies, with their area and their population according to the 1911 census, are as follows:

	Sq. M.	Pop.	Capital
Antigua*	171	32,265	St. John †
Montserrat	88	12,196	Plymouth
St. Kitts & Nevis †	150	48,803	Basseterre
Dominica	304	38,863	Roseau
Virgin Islands	58	5,562	Road Town
Total	716	126,318	

* With its dependencies, Barbuda and Redonda (62½ square miles, 991 inhabitants). † Including Anguilla (35 square miles, 4075 inhabitants). ‡ Capital of the colony.

Elementary education in the islands is denominational, except in Dominica, the denominations receiving grants-in-aid. Government savings banks are established in all the presidencies. There is no railway or internal telegraph. Cable connection exists with the continents. Statistics of trade and finance for the colony are given below for four years:

	1907-8	1908-10	1910-11	1913-14
Imports	2517,424	2485,393	2567,817	2558,862
Exports	521,509	441,728	558,165	677,256
Revenue *	152,608	149,670	164,875	174,456
Expenditure *	136,047	149,906	159,268	171,128

* Not including government grants.

See articles on the separate presidencies.

LEGISLATION IN 1915. Following is given a summary of the most important acts passed by the legislative sessions in various States. There were in session in 1915, 43 State Legislatures. In these there were introduced approximately 58,600 bills, and over 16,000 separate statutes, and of these more than 1000 were vetoed by the governors of States, leaving approximately 15,000 which became laws. The great majority of these statutes were local, special, or comparatively unimportant, but a large number of general statutes were added to the law. The chief measures passed have been classified below, the laws relating to elections are treated in the article ELECTORAL REFORM, the liquor laws under LIQUOR REGULATION, the labor laws under LABOR LEGISLATION, child labor laws under CHILD LABOR, laws relating to employees under

cle are discussed only those measures which do not properly come under any of these articles.

ADMINISTRATION OF JUSTICE. The Legislatures of Pennsylvania, Michigan, and Vermont passed important practice acts. The common purpose of these is to simplify procedure and hasten the final determination of cases. Each is a modification or evolution of the modified common law systems which have always been in use in these States. The Michigan and Vermont acts abolish all the common law forms of action, except assumpsit, trespass, replevin, and ejectment. The most notable feature of the Pennsylvania act is the extension of the use of affidavit of defense. It also abolished special pleadings and demurrers. The Michigan act provides, that where at the close of testimony a motion is made for a directed verdict and is denied, the trial court on motion or the appellate court on appeal may render a judgment in favor of the party thereto, notwithstanding the verdict. Similar acts were passed by the Legislatures of Minnesota and Wyoming. The Legislature of Massachusetts added a provision that "When exception to any ruling or direction of a judge shall be alleged, or any question of law shall be reserved, in the course of a trial by jury, and the circumstances shall be such that, if the ruling or direction at the trial was wrong, the verdict or finding ought to have been entered for a different party or for larger or smaller damages or otherwise than as was done at the trial, the judge may reserve leave, with the assent of the jury, so to enter the verdict or find, if upon the question or questions of law so raised the court shall decide that it ought to have been so entered."

The Michigan Legislature also passed a measure prohibiting the setting aside of a verdict or granting a new trial on account of merely technical errors. The New Jersey Legislature passed an important measure affecting equity practice. The Pennsylvania Legislature also made a radical change in the theory of equity practice. This provides that a suit in equity may be begun as in an action of law by summons, without first filing a bill.

A number of Legislatures passed bills in relation to trial of cases. Perhaps the most radical was in Pennsylvania. This measure authorizes in any action of law a written demand by either party for a jury trial, and further pro-

vides that if neither party files such a demand he shall be deemed to forfeit his right, and the court shall proceed to try the case without a jury. Somewhat the same measure was passed by the California Legislature. The Legislature of South Dakota provides for a verdict by five-sixths of the jury in civil cases.

Several Legislatures provided new remedies, but these were not of great importance. They are interesting chiefly to the practitioner. The Legislature of South Dakota provides that before any action for libel, other than a libel of a female, can be brought against a newspaper the plaintiff must give at least three days' notice, and if the statements were published in good faith and a retraction is made, as prescribed by the act, damages cannot be recovered.

There was little legislation of importance in the field of criminal law. An interesting act passed by the North Carolina Legislature makes it a misdemeanor for any officer to require any person charged with a criminal offense to appear in court for trial in any other apparel than ordinary civilian's dress or with head shaved or cropped unless so shaven or cropped while the person was serving a term of imprisonment for the commission of crime. The Ohio Legislature makes it a misdemeanor for any one having the custody of a person suspected or accused of a crime to refuse to permit such person to consult privately at any reasonable hour with an attorney. The death penalty was abolished in North Dakota, Oregon, and South Dakota. Laws providing for indeterminate sentence were passed in New York and Montana, and the Rhode Island Legislature made provision for the parole of prisoners. The Kansas act makes it a misdemeanor to expose or threaten to expose a paroled or discharged prisoner in order to extort money or prevent his obtaining employment. In New York the office of coroner was abolished, and the place of chief medical examiner created.

Several measures relating to the conduct of attorneys were prepared. The Oregon Legislature made it a misdemeanor for an attorney or any other person to advertise for business in divorce matters, and in Pennsylvania it was made a misdemeanor for attorneys to receive compensation for insurance sold to or solicited from clients.

ORGANIZATION AND ADMINISTRATION OF STATE GOVERNMENT. There was comparatively little legislation of importance relating to this subject. The North Dakota and Washington Legislatures passed measures creating State budget systems, and the Illinois Legislature revised the present budget system. New Hampshire Legislature also gave the Governor a certain degree of control over the finances, by requiring that the expenditure or all money appropriated to carry on the work of any department of the State government shall be subject to the approval of the Governor with the advice of the council under such general regulations as the Governor and council may prescribe. In Minnesota a constitutional amendment was proposed which would permit the Governor to approve in part single items on an appropriation bill. In New Jersey a measure was passed in the direction of economy and efficiency, by consolidating some half a dozen boards and commissions into a department of conservation and development. In California the office of State Purchasing Agent was created. In Kansas and Wisconsin

commissions were created to investigate the business methods of the State. In New York, however, the permanent State department of efficiency and economy was abolished.

Agricultural boards or commissions were established in several States, among them Pennsylvania, Delaware, and Ohio. In New Hampshire the State highway department was established, and in South Carolina a State board of charities and corrections was created. In Kansas all persons in the State service were classified, and the civil service commission to appoint commissions was created. The removal for religious or political influence or affiliation is prevented, and in all cases the removing officer must give notice to the commission, which is authorized to investigate the same. The appointment by State officials of persons related to them in certain degrees of relationship is forbidden in Idaho and Nevada. California forbids the employment of any person other than a citizen of the United States by the State or any county, or municipality, with certain exceptions. Colorado adopted a State song, and New Jersey a State flag. In Missouri the first Monday of October was made a holiday, to be known as Missouri Day.

MUNICIPAL HOME RULE. Municipalities in Connecticut and Virginia were given the power to frame their own charters. In Massachusetts an act was passed authorizing one of four plans in government. The Legislature of Nevada provided for the submitting of local and special legislation for the approval of the electors in the locality affected, and prevents the repeal of such laws without the consent of the voters of the locality which adopted them.

EDUCATION. Compulsory education laws were passed in Texas, Florida, and South Carolina. In Pennsylvania a State bureau of vocational education was created, and in Nebraska and Vermont provision was made for the establishment of vocational schools. A State department of education was created in Kansas, and in California a State board was authorized to determine the course of study in high schools, and upheld State subsidy in high schools whose courses were not approved by the board. The Legislature of Illinois appropriated \$5,000,000 for the State University. This is probably the largest sum ever appropriated in one year to a single institution of higher education in the country. The Texas Legislature proposed a constitutional amendment authorizing the counties to lend money to students to complete their education.

REVISION AND AMENDMENT OF STATE CONSTITUTIONS. The question of calling a constitutional convention was submitted to the voters in New Hampshire, South Dakota, and Tennessee. If authorized, the New Hampshire convention will meet in 1918, and the Tennessee convention, Nov. 15, 1916. In Tennessee amendments that are recommended by the convention will be submitted separately.

UNIFORM STATE LAWS. Bills recommended by the Conference Commissioners on Uniform State Laws were passed by the Legislatures of Oklahoma, Idaho, Arkansas, Vermont, Pennsylvania, Wisconsin, and Nevada. The Legislature of Wisconsin passed a uniform marriage act. The measures passed in other States are for the most part uniform bills of lading, uniform desertion and non-support acts, uniform partnership acts, etc.

THE PREPARATION OF LEGISLATION. In several

States measures were passed providing for careful preparation of measures, before presentation to the Legislature. In Vermont a provision was made for revision by draftsmen, who were appointed by the providing members of the House and Senate. Other legislation was the provision for the appointment by the Supreme Court of a commission to revise, redraft, consolidate, and arrange the public statutes of the State for submission to the next Legislature. Commissioners to revise and codify general branches of the law were created in several States, including Indiana, Utah, and Connecticut. A measure was passed by the Legislature of Illinois regulating lobbying.

HEALTH AND SANITATION. The State department of health was created in West Virginia. Provision for the collection of vital statistics was made by the Legislatures of Illinois and California. In Vermont several penalties were brought against persons who married while suffering from certain diseases. The sale or transfer of habit-forming drugs was regulated and restricted in Colorado, Idaho, Massachusetts, Michigan, Minnesota, Montana, and Nebraska.

LEHIGH UNIVERSITY. An institution for higher education, founded in 1866, at South Bethlehem, Pa. The total enrollment in all departments in the autumn of 1915 was 710, with 76 members of the faculty. There were no notable changes in the membership of the faculty during the year, and no noteworthy benefactions were received. The productive funds amounted to \$1,480,000, and the income from all sources in 1914-15 was \$297,959. The library contains about 137,000 volumes.

LELAND STANFORD JUNIOR UNIVERSITY. An institution for higher education founded at Stanford University, California, in 1891. The total enrollment in all departments in the autumn of 1915 was 2037. The faculty numbered 228. Mr. Clarke Butler Whittier, formerly of the law faculty of the university and recently of the law school of Chicago University, was made professor of law. Dr. Bailey Willis, of Washington, D. C., was appointed head professor of philosophy, filling the vacancy due to the transfer of Dr. J. C. Branner to the acting presidency of the university. These appointments all took effect on Aug. 1, 1915. At the close of 1915, President Branner retired, and Dr. Ray Lyman Wilbur, a graduate of the university, and the present dean of its medical school, became third president on Jan. 1, 1916. In addition to the appointments noted above, John S. P. Tatlock, formerly of Michigan University, was appointed professor of English philology. The productive funds at the end of 1915 were \$24,105,920, and the income \$1,235,891. The library contained 263,256 volumes. Ray Lyman Wilbur, A.M., M.D., was chosen president in October.

LEMNOS. The island was used as a base of supplies by the Anglo-French forces operating against the Dardanelles.

LEMON OIL. See CHEMISTRY, INDUSTRIAL, *New Method of Extracting Lemon Oil.*

LEMONS. See HORTICULTURE.

LE MOYNE, SARAH (COWELL). American actress, died July 17, 1915. She was born in New York City, and began her stage career in 1878, when she joined the Palmer stock company in the Union Square Theatre in New York City. She made an American success, and among the plays in which she was a star were:

Two Orphans; The Banker's Daughter; Mother and Son; and False Friends. After three seasons at this theatre she decided that her field was that of the reader and elocutionist. She selected Shakespeare and Browning as subjects and soon achieved wide fame. Her "Browning afternoons" at the Lyceum Theatre became extremely popular. Her greatest success was as an interpreter of Browning, and during one of her visits to England Robert Browning paid her many compliments as an exponent of his works. In 1888 she married William J. Le Moyné, and for four years was associated with her husband on the stage. One of the greatest tributes to her art was her selection to read the dedicatory ode at the Columbian Exposition in Chicago on Oct. 21, 1892. Her last appearance on the stage was in Margaret Anglin's revival of *Lady Windermere's Fan* in New York City in 1914.

LEPROSY. Additional testimony to the value of chaulmoogra oil in the cure of leprosy was brought to light in Manila, where 23 former inmates of the Culion Leper Colony were thoroughly examined and placed under a period of observation to determine whether the oil treatment, as administered at the colony, had been effective. It was agreed by the experts who examined them that all evidence of the disease had passed away and the patients were allowed to go to their homes. They will, however, be kept under observation for two or three years.

LESCHETIZKY, THEODOR. Austrian pianist, died Nov. 1, 1915. He was born in Lancut, Galicia, in 1830. His talents early made him a notable figure in the musical world, and in 1852 he went to Petrograd, where in spite of the fact that he was a Pole, his success was very marked. He became one of the founders of the Imperial Russian Musical Society. In 1878 he accepted a post in the St. Petersburg Conservatory. Although he still retained his great skill as a virtuoso, he rarely played after he began to teach. In the early eighties he removed to Vienna, and there he remained until a short time ago, when he went to live near Dresden. In Vienna he always had many pupils from every country, often as many as 200. The best known of his pupils is Ignace Paderewski, but many other famous players received their early instruction from him. Since the time of Liszt no piano teacher has earned such unquestioned authority. He wrote numerous compositions for the piano, and an opera called *The First Wink*.

LEUCOCYTE EXTRACT. An extract of the white blood corpuscles obtained from exudates artificially produced in the pleural cavities of rabbits by the injection of an irritant (aleurinat). The serum is believed to raise the resisting power of the body against bacterial poisons and to aid the action of specific serums or antitoxins. It is given by hypodermic injection, and it is especially indicated in infections before the correct bacteriologic diagnosis can be made. It is particularly beneficial in pneumonia and erysipelas.

LIBBY, CHARLES FREEMAN. American lawyer, died June 3, 1915. He was born in Limerick, Me., in 1844, and graduated from Bowdoin College in 1864. He studied law at the Columbia Law School, and in 1866 was admitted to the bar, engaging in practice in Portland. He was a member of the Maine Senate from 1899-1902, and was for one year president of that body.

From 1891 to 1912 he was president of the overseers of Bowdoin College. In 1909-10 he was president of the American Bar Association.

LIBERIA. An independent negro republic on the west coast of Africa, covering an area variously estimated at from 35,000 to 41,000 square miles, and a population of from 1,500,000 to 2,000,000, including about 12,000 Americo-Liberians. The indigenous negroes are mainly pagans, except the Mohammedan Mandingo tribe. About 50,000 of the coast negroes may be considered civilized. Monrovia (with about 6000 inhabitants) is the capital.

Native industries are backward, and trade is carried on under difficulties; roads being few and railroads unknown. Dense forest covers great tracts through which passage is not possible under present conditions. The imports for 1911 are stated at \$1,154,924, and the exports at \$1,013,849; 1912, \$1,667,857 and \$1,199,152; 1913, \$1,411,237 and \$1,112,187 (palm oil and kernels, piassava fibre, coffee, rubber, and ivory). Trade is mostly with Hamburg, the United Kingdom, the Netherlands, and the United States. Monrovia (since 1910) is a station on the cable route from Germany to Brazil, and (beginning with 1912) a station on the French cable route to French West Africa. Revenue, 1910-11, \$489,656; 1912-13, \$618,809; 1913-14 (budget), \$531,500. Expenditure, \$470,000 for the year 1911-12; \$529,548 for 1912-13; \$531,500 for 1913-14. External debt (1913), \$1,352,000; internal debt, \$200,000. A president elected for four years (Jan. 1, 1912-16, Daniel Edward Howard) is the executive.

LIBRARY ASSOCIATION, AMERICAN. A society organized in 1876 and incorporated in 1879 for promoting the welfare of libraries in America. The membership in September, 1915, was 3024. The 37th regular annual meeting, presided over by President Hiller C. Wellman, was held at Berkeley, Cal., on June 3-9, 1915, at which 779 members were present. The principal papers read at the meeting included: "The Book," Henry W. Kent; "Bulletins and Library Printing," Everett R. Peary; "The Fine Art of Printing," T. M. Cleland; "The Changing Literary Taste and the Growing Appeal of Poetry," May Massee; "Educational Opportunity of Libraries in Bringing Children and Books Together," Willis H. Kerr; "The Province of the Public Library," Richard Rogers Bowker; "New Features in Library Architecture," Chalmers Hadley; "How Far Should the Library Aid the Peace Movement and Similar Propaganda?" George F. Bowerman; "The Theory of Reference Work," William W. Bishop; "Pioneering in Utah," Mary E. Downey.

The officers elected at the annual meeting were as follows: President, Mary Wright Plummer, Library School, Public Library, New York; first vice-president, Walter L. Brown, Public Library, Buffalo, N. Y.; second vice-president, Chalmers Hadley, Public Library, Denver, Colo. The executive board consists of these officers and in addition Harrison W. Craver, Herbert Putnam, Arthur E. Bostwick, Judson T. Jennings, M. S. Dudgeon, and S. H. Ranck. The secretary is George B. Utley, 78 East Washington Street, Chicago, and the treasurer, Carl B. Roder, Public Library, Chicago. Special committees were also appointed for 1915-16 to study, among other things: cost and methods of cataloging; code for classifiers; deterioration of newsprint

paper; promotion and coöperation in the development of printed catalogue cards in relation with international arrangements; ventilation and lighting of public library buildings; and library work in hospitals and charitable and correctional institutions.

The American Library Association conferences are made of greater value by a system of sections whereby the different classes of workers may attend meetings and discussions especially adapted to their needs. These are as follows: College and Reference Section; Trustees Section (chairman, W. T. Porter, Cincinnati, Ohio); Catalogue Section (chairman, Sula Wagner, St. Louis, Mo., Public Library); Library Work with Children (chairman, Gertrude E. Andrus, Seattle, Ore., Public Library); Professional Training (chairman, Frances Simpson, University of Illinois Library School, Urbana); Agricultural Libraries Section (chairman, Malcom G. Wyer, University of Nebraska Library, Lincoln); School Libraries Section (chairman, Mary E. Hall, Girls' High School Library, Brooklyn, N. Y.).

Affiliated with the American Library Association are four national organizations of kindred purpose: National Association of State Libraries (president, A. J. Small, Iowa State Law Library, Des Moines; secretary-treasurer, Elizabeth M. Smith, New York State Library, Albany); League of Library Commissions (president, Fannie C. Rawson, Kentucky Library Commission, Frankfort; secretary-treasurer, Sarah B. Askew, New Jersey Public Library Commission, Trenton); American Association of Law Libraries (president, E. J. Lien, Minnesota State Library, St. Paul; secretary, Gertrude E. Woodard, University of Michigan Law Library, Ann Arbor; treasurer, Edward H. Redstone, Social Law Library, Boston); Special Libraries Association (president, Andrew Linn Bostwick, Municipal Reference Branch, St. Louis Public Library, 206 City Hall, St. Louis, Mo.; secretary and treasurer, Jesse Cunningham, Missouri School of Mines, Rolla, Mo.).

An important activity of the association is that of its Publishing Board, whose publications are put out at the society's headquarters in the Chicago Public Library Building. These include the *A. L. A. Booklist* (edited by May Massee) and the official *Bulletin*, besides nearly 100 publications in print. The new publications for 1915 include: a new edition of *Cataloging for Small Libraries*, by Theresa Hitchler; *Index to Kindergarten Songs*, by Margery C. Quigley; *Rural School Libraries; Books for Boys and Girls*, by Caroline M. Hewins; *Graded List of Stories for Reading Aloud*, by Harriot E. Hassler and Carrie E. Scott; *Library Rooms and Buildings*, by Charles C. Soule; and a new edition of *Binding for Small Libraries*, by A. L. Bailey. In addition to the chapters of the *A. L. A. Manual of Library Economy* already published, there appeared in 1915 the following chapters: "3—State Library," by J. I. Wyer, Jr.; "7—The High School Library," by G. O. Ward; "8—Special Libraries," by R. H. Johnston; "16—Book Selection," by Elva L. Bascom; "23—Government Documents (State and City)," by J. I. Wyer, Jr.; "24—Bibliography," by Isadore G. Mudge; "30—Library Work with the Blind," by Mary C. Chamberlain. Six chapters of the entire 32 are yet to be printed. The American Library Association prepared an exten-

sive exhibit for the Panama-Pacific Exposition in 1915.

LIBRARY BUILDINGS. See **ARCHITECTURE**; and **LIBRARY PROGRESS**.

LIBRARY OF CONGRESS. The library contained, at the end of the fiscal year 1915, 2,363,873 books, a gain of 110,564; 147,553 maps and charts, a gain of 5336; 727,808 volumes and pieces of music, a gain of 23,853; and 385,757 prints, a gain of 8945. Among the important bequests was a series of writings, books, maps, and manuscripts from the late Henry Harris. The bequest consisted of 220 volumes and pamphlets dealing chiefly with American history, and included many documents of rarity. Several important additions were made to the East Asiatic collection, including documents in Chinese and other languages. Several important gifts of manuscripts were received during the year. In February the last volume of the correspondence of George Washington was published, and many important papers relating to the colonial history of the United States were added to the library. The total number of copyright registrations during the year was 1,935,574.

LIBRARY PROGRESS. The year 1915 in American libraries was one of steady growth marked by no extraordinary events. The annual meeting of the American Library Association was held at Berkeley, Cal., early in June (see **LIBRARY ASSOCIATION, AMERICAN**). The new School Libraries Section had its first annual meeting with a large attendance, showing the interest in this rapidly developing form of library activity.

LIBRARY LEGISLATION. Despite the fact that in 1915 the Legislatures of 43 States were in session, a small amount of constructive legislation affecting libraries was placed on the statute books. West Virginia alone passed a general library law, and this merely a permissive measure, allowing municipalities to establish and maintain public libraries. Attempts to pass general legislation failed in Pennsylvania and Indiana. An increase in appropriations for library purposes was granted in a number of States, while no serious decreases were suffered. Connecticut, Iowa, and South Dakota made slight changes in their general laws governing libraries. Kansas increased the tax limit for libraries from four- to five-tenths of a mill in cities of less than 40,000 inhabitants, while in cities of a greater size the limit was placed at one-fourth of a mill. Texas and Montana each made provision for county libraries, differing materially as to details of operation. This makes 14 States in which county libraries are recognized by law. Arizona established a State Library and California a branch of its State Library in San Francisco to care for the Sutro Library, given to the State by the heirs of Adolph Sutro. North Carolina created a legislative reference library under the control of the State Historical Commission.

LIBRARY APPOINTMENTS. Willard Austen succeeded to the librarianship of the Cornell University Library on the retirement of G. H. Harris; George P. Winship was made custodian of the Widener Memorial Collection at Harvard on the death of Luther S. Livingston; William W. Bishop succeeded T. W. Koch as librarian of the University of Michigan.

NECROLOGY. Mr. John Edmands, one of the oldest librarians of the country, and long head

of the Mercantile Library of Philadelphia, died at the age of 95. Prof. George T. Little, the veteran librarian of Bowdoin College; Erastus S. Willcox, librarian of the Peoria (Ill.) Public Library; Dr. Luther S. Livingston, custodian of the Widener Memorial Collection at Harvard, and one of the foremost bibliographers of the world; and Mr. F. A. Crandall, formerly superintendent of documents and lately in charge of the *Monthly Catalog of Government Documents*, were among the year's losses by death.

LIBRARY BUILDINGS. The great Widener Library of Harvard University was completed and occupied in June. This is the largest university library building in the country, and is remarkable in many ways other than size. The University of Missouri has completed the central portion of a new building, and Johns Hopkins has finished but has not yet occupied Gilman Hall, the new library building. Several large and important buildings are under way or have been provided for, some of which should be completed in 1916. Even more noteworthy than many a new building was the successful fireproofing and remodeling of the Boston Athenæum.

LIBRARY LITERATURE. As usual, the Library of Congress published important contributions to professional literature, the most notable being Mr. F. W. Ashley's *Catalogue of the John Boyd Thatcher Collection of Incunabula*. The Manuscripts Division contributed four imposing volumes indexing the *Washington Correspondence*, and vol. xxii of the *Journals of the Continental Congress*. The third volume of the *List of Geographical Atlases* was published, completing the work. A *Guide to Spanish Law* was issued by the Law Library, while the classification schedules were published for certain sections of Literature, Folklore, and General Works. The Bureau of Education issued its welcome list of *Public, Society, and School Libraries* (Bull. 1915, No. 25), and a brochure on *Library Instruction in Universities, Colleges, and Normal Schools*, by H. R. Evans. Other notable publications were: A. E. Bostwick, *Relationship Between the Library and the Public Schools* (White Plains, N. Y., H. W. Wilson Co.); M. Mann, *Rules for Filing Cards* (Pittsburgh, Carnegie Library); F. H. Garrison, *Life of John Shaw Billings* (New York, Putnam); T. Hitchler, *Cataloging for Small Libraries* (rev. ed., Chicago, American Library Association Publishing Board); G. P. Winship, *The John Carter Brown Library* (Providence, The Library); A. J. Gates, *Catalog of Technical Periodicals: Libraries in the City of New York and Vicinity* (Library Board of the United Engineering Societies); G. D. Fellows, *Cataloguing Rules* (Bulletin, New York State Library School, Albany, No. 36); I. T. E. Firkins, *Index to Short Stories* (White Plains, N. Y., H. W. Wilson Co.); A. E. Bostwick, *Making of an American's Library* (New York, Appleton & Co.).

LIBYA. An Italian possession on the Mediterranean coast of Africa, composed of Tripoli and Cyrenaica. It lies between Tunis and Algeria on the west and Egypt on the east. As a result of the Turco-Italian War, Tripoli, hitherto a vilayet of the Ottoman Empire, was proclaimed at Rome, Nov. 5, 1911, together with Cyrenaica, a province of the kingdom of Italy. The area, with Cyrenaica (or Bengazi, or Barca), is estimated at 405,800 square miles, and the

population at about 1,000,000. The city of Tripoli, with 75,000 inhabitants, is the capital of Tripoli; Bengazi, with 30,000, of Bengazi; both Mediterranean ports. The trade stream flows through these ports, and is fed by the caravan routes across the Sahara, which are the natural outlet by which Sudanese trade reaches the sea. Railway construction was begun in 1912. Caravans now cross the Sahara in from 3 to 5 months, according to the route taken, and the number and strength of robber bands to be overcome.

The total commerce of the country is reported for 1912 as follows: 27,781,985 lire imports, 4,028,520 lire exports (esparto, hides and skins, ostrich feathers, sponges, live animals, wool, cereals, etc.). The revenue has been derived from taxation on the wealth of the individual and from tithes. Large state subventions are now necessary.

HISTORY. On February 8th a column of 300 Italian troops was attacked by 1000 rebels at Du-nedjem, about 50 miles from the Mediterranean coast. After a day's fighting the rebels scattered. Early in May the Arab chiefs at Sirte rebelled against the Italians and in the fight that followed 4000 irregular native troops went over to the support of the rebels. More than 700 regular troops were killed and wounded. It was felt that the Italian government had placed too much confidence in the loyalty of the Arab chiefs and immediate steps were taken to prevent a repetition of the revolt. Ten days later, however, a column of infantry and cavalry was attacked at Misurata, and 15 Italians were killed. On July 15th General Tassoni, Governor of Tripoli, was recalled to Italy, and General Ameglio, Governor of Cyrenaica, was made administrator of both provinces.

LIFE AND ADVENT UNION, THE. See ADVENTISTS.

LIFE INSURANCE. See INSURANCE.

LIGHT. See ELECTRIC LIGHTING; and PHOTOGRAPHY.

LIGHTHOUSES. The number of aids to navigation maintained by the United States Lighthouse Service on June 30, 1915, as compared with 1914, is shown by the accompanying table:

Class	Total June 30—	
	1914	1915
Lighted aids:		
Lights (other than minor lights)...	1,588	1,662
Minor lights	2,790	2,837
Light-vessel stations	52	53
Gas buoys	454	479
Float lights	118	124
Total	5,002	5,155
Unlighted aids:		
Fog signals	519	527
Submarine signals	48	50
Whistling buoys, unlighted	86	86
Bell buoys, unlighted	282	287
Other buoys	6,823	6,488
Day beacons	1,975	2,001
Total	9,183	9,889
Grand total	14,185	14,544

During the fiscal year ended June 30, 1915, there was a net increase of 359 in the total number of aids to navigation maintained by the United States Lighthouse Service, including 74 lights above the order of minor lights, 1 light vessel, 8 fog signals, 2 submarine bells, 26 day-

marks, 25 lighted buoys, 170 unlighted buoys, and 53 minor lights (including 6 float lights). The Commissioner of Lighthouses also reported that fixed lights were changed to flashing or occulting at 29 stations. The illuminant of 21 lights was changed to incandescent oil vapor, the illuminant of 24 lights (including 1 light vessel) was changed to acetylene, and the illuminant of 3 lights (including 1 light vessel) was changed to oil gas. New light vessels, with flashing lights and compressed-air fog signals, were established at Poe Reef, Straits of Mackinac, Lake Huron, Mich., and Buffalo entrance, Lake Erie, N. Y., former light-vessel stations, which had been temporarily discontinued.

New light and fog signal stations were constructed at Brandywine Shoal, Del., and Thimble Shoal, Va., in place of former structures, and a complete new system of lighted aids was established at the approaches to the Cape Cod Canal, Mass., which was opened in 1914.

An important lighthouse was under construction in 1915 by the United States at Navassa Island, an isolated rock between Cuba and Haiti, and in the track of vessels sailing between the North Atlantic ports and the Panama Canal. This new lighthouse is a round tower of reinforced concrete, and the focal plane of the lens is 402 feet above water level. The light is 56,000 candle power, giving a double white flash every 30 seconds, and was to be visible for 27 nautical miles.

LIGHT-STROKE. It has long been recognized that light, in spite of its healing and restorative powers and its potency in destroying pathogenic bacteria, may be a pathological agent. In this connection the work of certain investigators into the photodynamic action of certain organic substances is of great interest. It has been shown that if suitable sensitizing compounds are injected into albino mice, which from their lack of skin-pigments and hair-pigments possess little natural protection against the direct action of the light rays, these animals are rendered peculiarly irritable when exposed to the light, although they are unaffected in the dark. Hematoporphyrin, which is derived from the pigments of the red blood corpuscles, is generally used in such investigations. While it is not toxic in itself, when injected into animals which are subsequently exposed to the light, these animals develop cutaneous lesions, subcutaneous edemas, and other severe disturbances, either acute or chronic and not infrequently fatal. Hausmann has succeeded in sensitizing animals to such a degree that profound reactions are produced immediately on exposure to light. They enter promptly into a state of narcosis terminating fatally within a few minutes. There is a certain analogy between these manifestations and those of true heat-stroke; and further experimentation may enable scientists to determine the now obscure relationship between light and heat.

LIGNIN. See CHEMISTRY, INDUSTRIAL, *Cotton Substitutes*.

LINDSEY, BEN B. See COLORADO, *Politics and Government*; and JUVENILE COURTS.

LIQUOR REGULATION. Three States, Alabama, Arizona, and Colorado, became prohibition States in 1915, Alabama under the operation of a new statute passed by the Legislature, and Arizona and Colorado as the result of constitutional amendments carried in 1914. Measures regulat-

ing the liquor traffic, and practically amounting to prohibition, were passed in other States. In Arkansas the Newberry State-wide prohibition bill was passed by the Legislature and signed by the Governor. This bill prohibits the sale of liquor after Jan. 1, 1916. It makes violation a felony, providing terms of imprisonment of one year or more in the State penitentiary, and forbids suspended sentence. For liquor legislation in Arizona, see ARIZONA, *Politics and Government*. The Idaho Legislature passed a State-wide prohibition bill, which makes the manufacture and transportation for sale of intoxicating liquors unlawful after Jan. 1, 1916. The Legislature also passed a resolution providing for the submission to the voters at the next general election of a constitutional amendment prohibiting the manufacture and sale of intoxicating liquors after May 1, 1917. The Iowa Legislature passed a measure repealing the Mulct Law, and providing for statutory prohibition, pending action of a constitutional amendment. A resolution was also adopted by the Iowa Legislature providing for the submission to the people of the question of constitutional prohibition, if it is successful in the Legislature convening in 1917. A county option bill was passed by the Minnesota Legislature. Under its provisions elections were held in the majority of the counties during the year. A resolution providing for the submission of a constitutional amendment for State-wide prohibition was defeated in the lower house of the Legislature. The Legislature of Montana passed a measure providing for the submission of the question of prohibition to referendum, instead of submitting a constitutional amendment. Under the terms of this measure prohibition would become effective Dec. 31, 1919. A local option bill which passed the New Jersey Senate was defeated in the House of Assembly, by a vote of 44 to 13, after one of the most stormy sessions in recent years.

State-wide prohibition becomes effective in Oregon on Jan. 1, 1916, as a result of a constitutional amendment carried in 1914. The Legislature of South Dakota passed a resolution providing for the submission to the people of a constitutional amendment for State-wide prohibition. The amendment will be voted on at the general election in 1916. The Legislature of Utah passed a State-wide prohibition measure which was vetoed by the Governor. However, a bill was passed imposing heavy penalties for the shipment of liquor from wet to dry territory. The General Assembly of South Carolina devoted a large part of its session to the discussion of prohibition. A State-wide law for submission to referendum at the election of Sept. 12, 1915, was passed, as well as a statute making effective in the State the provision of the Webb-Kenyon Federal Act, against the shipment of liquor from wet to dry territory. The statute also provided that there might be shipped not more than one gallon of alcoholic liquor to any one person in the State, during any one month. The Legislature of Tennessee passed a measure providing for the removal from office of State, county, or city officers other than holders of constitutional offices who failed to enforce the laws of the State. This is directed especially against failure to enforce the prohibition law. Other measures aiming at a more stringent enforcement of the law were passed. The Vermont Legislature voted to submit a prohibition law to the people at the

municipal elections in the spring of 1916. This law makes no provision for the sale of liquor for medical purposes. In West Virginia the Legislature enacted amendments to the prohibition laws, which limited shipments of liquor into the State, and forbade a person to have liquor at a public place, even for his own use. In the New York Legislature a bill providing for State-wide referendum on prohibition was defeated.

The most important election relating to liquor regulation was in Ohio where, on November 2nd, the State-wide prohibition amendment was defeated by a vote of over 40,000. In Illinois, in an election held on April 6th, most of the central and southern counties voted no-license. The women who voted at this election divided their ballots almost evenly on the issue. The elections held in Michigan on April 5th showed that the no-license voters were successful in 14 counties, and license voters in 2. County option elections were held in Minnesota. Ten counties voted license, and one no-license. There were material gains for no-license in Wisconsin in the election held on April 6th. No-license gained 13 towns, and license 1 town. The largest cities voting on the question went for license.

LIQUORS. The year 1915 will be a memorable one for those interested in liquors. The war in Europe, with its effect on labor and consumption, the ravages of vine disease in the French districts in which a good vintage was expected to be obtained, legislation and edicts by several of the warring nations against the use of spirituous beverages, and, in the United States, the continued fight for prohibition, together with the Federal taxation of still and fortified wines, champagnes, and cordials, all combined to make the road of those engaged in the business a difficult one.

LEGISLATION. By a joint resolution the Congress of the United States, December, 1915, continued for a year the new emergency war revenue tax of 8 cents a gallon on wines, 20 cents a quart on champagne, 24 cents a gallon on cordials, 50 cents a barrel additional on beer, and 55 cents a proof gallon on brandy used in fortifying wines. The practice of having government gaugers gauge spirits for rectifiers was abolished. The *Pharmacopœia* has withdrawn whiskey and brandy from the new edition.

Seven additional States will "go dry" Jan. 1, 1916, as follows: Colorado, Iowa, Washington, Oregon, Idaho, Arkansas, and South Carolina, making 19 States which will be dry in 1916, with a combined population estimated at 8,250,000. See also LIQUOR REGULATION.

The Government of Great Britain has taken over the sale of liquors in many towns, and has limited the hours during which liquors may be sold; the board of control appointed to deal with the munitions areas has ordered that there shall be no treating, and has prohibited the giving of credit for liquor. The hours of sale are from 12 M. to 2:30 P.M., and from 6 to 8 P.M. No orders can be accepted for spirits to be consumed off the premises on Saturday or Sunday. The United Kingdom has also passed an act called the British Immature Spirit (restriction) Act, which provides that all malt and grain whiskey must be bonded for three years after it is made.

The Russian government has prohibited the sale of vodka.

A bill has been introduced in the French Cham-

ber of Deputies providing for a reform in the liquor trade. This provides for the suppression of privileges enjoyed by private individuals to distil brandy from their own fruits; for an increase in the tax on alcohol from \$2.40 to \$5.00 a gallon; and for a tax of \$1.00 a gallon on appetizers and liqueurs. It further suggests that the government create a monopoly in the manufacture of industrial alcohol.

In Germany the production and quality of beer has been lowered by the demand for grain by the army, so that sugar is extensively used as a grain substitute.

Sweden, since the beginning of the war, has been curtailing the sale of liquors. The so-called "Stockholm System" has been extended until it includes approximately one-third of the districts, and will after Jan. 1, 1916, apply to the entire country. According to this system each citizen is allowed only a fixed quantity of spirituous liquor.

WINES. All reports from France seem to agree that the champagne crop will be an excellent one, the vines in some cases extending even to the German lines, and, according to the *Temps's* expert, the vintage of 1915 should be a second miracle of the Marne.

For the rest of France the reports are not as good. In the southern and western parts the vineyards have suffered severely from mildew, caused by the abnormally heavy rains and insufficient cultivation, due to the scarcity of trained labor. In the Department of Gard the vintage will probably be a total failure. The yield will hardly exceed 330,000,000 gallons, or one-half of an average yield. Prices for wines have doubled. One cause for the increased price of wine, in addition to the failure of the 1915 vintage, is that the government is making a special effort to supply the men at the front with wines, spirituous liquors not being allowed in the zone occupied by the armies of France.

To add to the troubles of the wine growers, casks and laborers are very scarce. To aid the wine growers, prisoners of war are provided, on request of the mayoralties of the different communities, to assist in the cultivation. The growers pay for the support of the men and give to each prisoner four cents (American) a day for pocket money. The only saving grace in the situation is that the 1914 wines are developing into a very promising product.

In Algeria the crop will probably be short on account of mildew.

In Italy only one-half a crop is expected.

From Germany the reports are favorable. In fact it is expected that throughout the Cologne district the vintage will rival the famous ones of 1893 and 1911. Statistics for the 1914 vintage are: Area cultivated, 251,928 acres; production, 24,335,327 gallons; total value, \$9,924,600; value per gallon, 41 cents.

In California conditions both natural and legal have hurt the wine industry. The vines have been more or less damaged by mildew. The yield of dry wine should be about 75 per cent of that of normal times. As regards sweet wines, the production will be low,—just what is ordered by the Association. This is due to the heavy Federal tax of 55 cents a gallon on the brandy used in fortification. As a heavy stock of fortified wines had been carried over from previous years, it will not be necessary to make much of these wines to meet normal trade de-

mands. A considerable quantity of sweet wine grapes will be made into dry wines; the balance of the crop used will be made into raisins or used for the production of brandy which will be aged in bonded warehouses. A normal production of California sweet wine would be 18,000,000 gallons, which under the old laws would have paid \$125,000 in tax. It is doubtful if over 3,000,000 gallons will be produced this year. For the fiscal year 1915 the tax collected on brandy used in fortification was as follows:

At 3 cents per proof gallon.....	\$123,853
At 55 cents per proof gallon.....	\$188,383
Total gallons of fortified wines produced..	17,218,662.

FERMENTED LIQUORS. The following table shows the production of fermented liquors, per capita consumption, etc., in the United States for the past two years:

Year	Bbls. beer	Per capita gallons	No. of breweries	Retail dealers
1914	...66,189,478	20.51	1,892	15,760
1915	...59,808,210	....	1,843	13,740

It will be seen that the production has dropped about one-tenth.

If statistics were available it would be interesting to know the production of the so-called near-beers, that is, fermented liquors containing less than $\frac{1}{2}$ per cent of alcohol. The spread of prohibition has given a tremendous impetus to this class of liquors, but as no tax is required, no records are available.

In Germany it is calculated that the production of beer will be only about 60 per cent of normal, owing to the lack of grain, and that about 20 per cent of this amount will be requisitioned for the army.

DISTILLED SPIRITS. The following amounts of distilled spirits were produced and consumed in the United States in 1914 and 1915:

Year	Production proof gallons	Tax paid for consumption proof gallons	Per capita consumption proof gallons
1914	...181,919,542	189,138,501	1.46
1915	...140,656,103	124,155,178	...

There were bottled in bond in 1914 10,441,588 proof gallons of spirits, and in 1915, 9,748,978 gallons.

It is difficult to draw conclusions from these figures, since there has been an over-production for some years, and the decrease in 1915 may be due to an attempt to catch up and not to a real decrease in consumption, although the bottled in bond figures indicate that there was a less demand for this class of goods.

It is interesting to note the figures on illicit distilling. In 1914, 2667 stills were seized; in 1915, 3832. While making the raids on the captured stills, four officers were killed. The Commissioner of Internal Revenue states that "The business of the 'moonshiner' in whiskey in the Southern States appears to be increasing."

It is stated that many large orders for alcohol have been placed in this country by some of the warring nations, as it is a very necessary adjunct to the manufacture of the nitro-cellulose explosives. It is estimated that every time a 14-inch gun is fired a barrel of alcohol is consumed. In order to supply some of these orders

a new distillery has been erected at Baltimore, Md., which will be the largest in the world.

DENATURED ALCOHOL. The following table shows the number of denaturing warehouses and their output for the past two years:

Fiscal year	Number of dena- turing ware- houses	Total			
		Completely denatured	Specially denatured	Wine gallons	Proof gallons
1914	25	5,213,129.56	5,191,846.08	10,404,975.59	17,811,078.2
1915	23	5,386,646.96	8,599,821.81	13,986,468.77	25,411,718.8

LITERATURE. See FRENCH LITERATURE; GERMAN LITERATURE; ITALIAN LITERATURE; LITERATURE, ENGLISH AND AMERICAN; SCANDINAVIAN LITERATURE; SPANISH LITERATURE.

LITERATURE, ENGLISH AND AMERICAN. In every branch of literature the influence of the War of the Nations was felt in 1915. The preoccupation with the conflict was more evident in France (see FRENCH LITERATURE) and in Germany (see GERMAN LITERATURE) than in England, where its literary influence was not as pervasive as might have been expected. British scholarship and British letters—and the same is measurably true of French productions in these fields—have shown, during the war, remarkable qualities of coolness and self-possession. In England books came from the press in 1915 without startling signs of abatement, and the same was true of America. The high tides of emotion which swept over Europe from the war have as yet, strange as it appears, found no adequate expression in the poetry, the fiction, or the drama of any of the European nations, or in America, unless the work of d'Annunzio be excepted, and will perhaps remain to provide an imposing epic theme for some titanic genius of the future. What is stranger still, the war has failed to cast a gloom over the books of the year in either England or America—a phenomenon to be explained, perhaps, as a reaction of the imagination from the haunting terrors of the time, by a desire to find in the spell of art an escape from tragic preoccupations, or by the fact that this year's books, like last year's, were in large part planned or written before England felt the full effects of the struggle. The spiritual depths have, however, been stirred by the war, and men of religion and philosophy have pondered its bearing upon the faith and doctrine of Christendom or upon the foundations of their philosophies.

Only by qualities unrelated to their special purpose do war books come within the scope of a survey primarily literary. Since the list offered in the 1914 YEAR BOOK, more than 600 books and pamphlets about the war have appeared in English, descriptive bibliographies of which are conveniently accessible in four issues (1915) of the *New York Times Review of Books*. These works cannot here be discussed. Certain of the best of them are cited in the article WAR OF THE NATIONS. Suffice it to remark in this place that some of our most accomplished writers have had their say about the conflict in books of the year's publication, among them Arnold Bennett, H. G. Wells, Rudyard Kipling, Miss May Sinclair, Mrs. Wharton, and Hilaire Belloc, while historians and scholars have been prompt with occasional works, concerned in a more or less philosophic spirit with the remote causes and broader aspects of the struggle, among which

may be mentioned at random books from the pens of John Oman, John Holland Rose, and the Earl of Cromer.

The reader is referred to the articles **DRAMA, AMERICAN AND ENGLISH; PHILOLOGY, MODERN;**

PHILOSOPHY, *Philosophy and the War*; and SOCIOLOGY, for books in the fields indicated by those titles.

FICTION. In both England and America in 1915 fiction bulked largest in the output of books, though, as against 1914, there was a decrease in quantity—a decrease not offset by any marked improvement in quality. The public taste in novels, if not above criticism, was still not beneath it, and there is ground for satisfaction in recalling that novels as good as Hopkinson Smith's *Felix O'Day*, W. J. Locke's *Jeffery*, and Winston Churchill's *A Far Country* were among the year's best-sellers, while a strong partiality was shown for Arnold Bennett's *These Twain*, and H. G. Wells's *The Research Magnificent*.

English. In English fiction it was the realistic novelists who, in 1915, held, and deserved to hold—be it said without prejudice to romance—the close attention of the public. This year Arnold Bennett ended, with *These Twain*, the trilogy that began with *Clayhanger* and continued with *Hilda Lessways*, and in so doing completed a masterly and searching study of middle-class life and character among the ovens, chimneys, and smelting furnaces of the towns of North Staffordshire. H. G. Wells held his own as novelist and critic of society and morals in *The Research Magnificent*, a story of the quest of the noble life and the means of spreading it in widest commonalty. And his fertility was once more evinced by the appearance in the same twelve-month of a second and very different book, the farcical, whimsical *Bealby* with its kaleidoscopic succession of comic incidents. As a masterly poser, through the art of fiction, of present day English problems, John Galsworthy made a characteristic appearance with *The Freelanders*, a study of the agricultural laborer and his relations to the landed gentry. And to 1915 belongs the same author's series of satirical character sketches, *The Little Man and Other Satires*. The daughter of Alice and Wilfrid Meynell, Miss Alice Meynell, told in *Columbine* the story of a young man of letters who had his amatory difficulties in choosing between a would-be actress and an attractive and withal self-respecting stenographer. Realistic, but in a vein sufficiently different from the works above mentioned, is Eden Philpotts's *Delabole* in which the author turned from Dartmoor to write a moving story of the slate quarries of Cornwall. Quite as faithfully realistic, but concerned with life on the higher social levels, is Mrs. Humphry Ward's *Eltham House*, where we hear of the disastrous effect of a dubious divorce and matrimonial rearrangements on the career of a titled and ambitious young Englishman. W. Somerset Maugham's *Of Human Bondage* was a novel that found a cordial welcome. It was especially interested in the

effect upon a young man's character of his cosmopolitan education in English schools, in a German university, as an art student in Paris, and as a medical student in London. Anthony Hope, the quondam romancer, offered a transcript of modern life everywhere in contact with contemporary reality in *A Young Man's Year*, a record of a red-letter year in a gentlemanly young man's life. Like Arnold Bennett, J. D. Beresford completed in 1915 the third volume of an expansive realistic trilogy—*The Invisible Event*—concerned with the fortunes of Jacob Stahl. And to this year belongs Archibald Marshall's *The Old Order Changeth*, which, in its literal faithfulness to the life of the old gentry, the judicious have compared to the work of Trollope. E. F. Benson's laboriously realistic *Arundel* is not likely to add to his fame, nor Canon Hannay's *Minnie's Bishop and Other Stories* to his. Two compatriots of the Canon's, the ladies who collaborate as E. A. O. Somerville and Martin Ross, leave him far behind, as they always have left him, as writers of racy Irish stories. For "divilment and divarshion," for wit, spontaneous fun, and sheer refreshment we commend the reader to their stories, and not least cordially to their latest, *Mr. Knox's Country*. Richard Price in *David Penstephen* made a study of the irregular union of an "advanced" couple who would not wed, and of the consequent penalties paid to society, even to the second generation. Sir Gilbert Parker, in a story of French Canada, *The Money Master*, wrote in his best vein one of the best-sellers of the year.

The historical romance will not willingly die. This year men fit—and unfit—for adventure in this literary field were not wanting. In *The Glorious Rascal*, Justin Huntley McCarthy made Villon his hero, and idealized that engaging black sheep in stogy and unconvincing fashion. John Trevena is responsible for *Matrimony* and *Moyle Church Town*—the first a picture of true love in the Middle Ages, sacramentally sealed in marriage; the second a tale of Cornwall in the eighteenth century. S. R. Crockett offered his *Hal o' the Ironsides*, an historical novel of Cromwell's time; and A. E. W. Mason his Jacobean story *Laurence Clavering*. Baroness Orczy brought history into fiction in *The Bronze Eagle*, which follows Napoleon from Elba to Waterloo, and also wrote a story of another type in *A Bride of the Plains*, which involves charming pictures of Hungarian country life.

A strong infusion of romantic sentiment, incident, or adventure is present in Joseph Conrad's *Victory*, a fine tale of the Eastern seas and islands, worthy to stand beside *The Nigger of the Narcissus*; in Maurice Hewlett's *The Little Iliad*, an old story in modern guise, complicated by matrimonial difficulties and with room enough for the play of wit and satire; in *Jeffery*, one of the year's best-sellers, and a work thoroughly characteristic of its author, W. J. Locke; and in H. Rider Haggard's *Allan and the Holy Flower*, where we gladly meet again our old friend Allan Quartermain, now plunged in desperate adventures with crafty Kaffirs and Zulus fierce but faithful.

American. At present, in America as in England, it is the realists who best repay a reading. They picture faithfully, and often fruitfully interpret, in works that now and again reach a high standard of excellence, representative aspects of American life, and types of national

character observed from sea to sea and from the Great Lakes to the Mexican border. Some half dozen of these must claim attention in any estimate of the year's literature. Among them Winston Churchill has won repeated triumphs, and, on the score of earnest endeavor at least, earns for each appearance a wreath of greenest laurels. This year he wrote, in *The Far Country*, a story concerned with those regions of American politics or high finance into which our enterprising prodigals too often stray—a story that brings the erring son to his right mind before the parable is ended. In earlier novels of his, this author, if less impressive as a preacher, has been more beguiling as story-teller. By the sympathetic realism, or naturalism, of such books as *Jennie Garhart*, Theodore Dreiser attracted a not indiscriminating audience—an audience not likely to be as well pleased, however, with his latest novel, *The Genius*, where we follow the career of an artist who drifts from his native Indiana town cityward to undergo varying fortunes, artistic, amatory, and financial. Mr. Dreiser's tendency to interpret life too exclusively in terms of natural instinct here, as elsewhere in his work, impairs, perhaps, that complete correspondence to the complex truth of human motive upon which the realist chiefly prides himself. Be that as it may, handsome acknowledgments are due this author for the light he has thrown upon certain aspects of social life and certain types of character, which, thanks to that illumination, may be more clearly seen and better understood. Realism and romantic feeling blend in Frank Hopkinson Smith's *Felix O'Day*, which has the freshness and genial warmth that characterize the work of this talented and versatile man whose career but now ended abruptly, while he still seemed in the fullness of his powers. It is a story of separation and reconciliation, which includes engaging sketches of warm-hearted working people of New York's East Side. *Felix O'Day* has been named as among the best-sellers of 1915, and so also Booth Tarkington's *The Turmoil*. The scene of the latter book is in the Middle West, and it has for hero a young man who, in the world of commercialism, strives to keep his idealism and imagination vigorous and fresh. Partly Middle-Western in scene is also Dorothy Canfield's *The Bent Twig*, where, as in her other stories, a serious attempt is made at interpreting, as well as presenting, the American life the author has known, whether in the Middle West or in New England. In her heroine, the "twig" of the story, whose upward bent towards things of good report effectively protects her from the alluring desires of the moment, there is a something distinctively of her own country. A sound piece of this year's realism is Willa S. Cather's *The Song of the Lark*, with a prima donna made in America—and well made—for a heroine. The public that has enjoyed the work of Robert Grant should find entertainment in his new story of Boston life, *The High Priestess*, the latest of the long series of Judge Grant's novels, for the quality of which his recent election to the American Academy of Arts and Letters may stand sponsor. Among the pronounced successes of the year was Ernest Poole's *The Harbor*, which throws a blended light of poetry and realistic truth over New York Bay, past and present.

The embarrassment of choice among the host of remaining novels is extreme. In *Around Old*

Chester, Mrs. Deland, with her familiar literary grace, leads us among old and valued friends. In John Corbin's *The Edge*, a young New York couple, bred in wealth and fashion, slide down the social scale, victims of the fateful combination of marriage, children, and an income quite beneath contempt. Under the light and pleasant surface of William Farquhar Payson's *Love Letters of a Divorced Couple*, and at the heart of a story of estrangement and reconciliation, is a pith of moral common sense, which, while it beguiles the reader, may edify him unawares. Marion Harland, with many years and many and varied labors of the pen behind her, in *A Long Lane*, wrote vigorously of village life in the New Jersey hills she knows so well. It is village life of which we read in David Grayson's *Hempstead*, steeped in sweet sentiment and optimistic sunshine, a tale exactly to the taste of those whose artistic appetites were appeased by *The Old Homestead* and *Shore Acres*. Bathed in sunshine and sentiment, too, is George Barr McCutcheon's *Mr. Bingle*, a book ebullient with the most benevolent amiability, and certainly worthy of a place of honor among the other productions of the same pen. From Gouverneur Morris came *The Seven Darlings*, an ephemeral tale of the smoothly running true loves of six heroines and as many heroes; from Robert W. Chambers the not less ephemeral *Athalie*, a book full of unreal people set down in the real city of New York. Montague Glass, in the short stories of *The Competitive Nephew*, wrung good entertainment from the clothing trade and other phases of Jewish life in the metropolis. A book made to be swallowed whole by young people in their mating season was Mary Shipman Andrews's *August First*. A cluster of best-sellers, various in kind and quality, also invite attention here. There are Kathleen Norris's *Julia Page*, which tells how dear a woman pays for one transgression; Henry Sydnor Harrison's *Angela's Business*, hardly likely to rival *Queed* or *V. V.'s Eyes*; Mary Roberts Rhinehart's *K*, with its buoyant and happy heroine; Gene Stratton Porter's *Michael O'Halloran*, with its appallingly voluble super-newsboys, its unreal lay figures, and its gushes of optimistic sentimentality; Mrs. Eleanor Hodgman Porter's *Pollyanna Grows Up*, where the heroine makes glad the heart of poor Jamie of Murphy's Alley, Boston, and gladdens, too, the heart of the wealthy, yet lonely widow of Commonwealth Avenue of the same city; and Harry Leon Wilson's *Rugles of Red Gap*, a farcical novel setting off genteel English social conventions against a background of crude, democratic American simplicity.

America provided in 1915 its quota of romance, historical and other. In Jeffrey Farnol's *Beltane the Smith*, a story effusively welcomed in all but rigorously critical quarters, the air is thick with the aroma of mediæval chivalry—knights and ladies in bower and hall, knights panoplied for errant adventure, and a hero righting wrongs and winning a duchess for his pains. By valor and strength of thew, the hero of another mediæval romance, Miss Mary Johnson's *The Fortunes of Garin*, also wins a lady of high degree. Randall Parish, in *Beyond the Frontier*, chose frontier life in the days of La Salle for his theme. Mrs. Frances Hodgson Burnett, in *The Lost Prince*, dealt romantically with a Serbian legend. Among the historical novels of the

year was Stewart Edward White's *The Gray Dawn*, set in the hurly-burly of the fifties of California, when the vigilantes were active—the third part of the trilogy that began with *Gold*.

A group of stories full of incident and adventure or tinged with romantic feeling may be mentioned in connection with the romances and historical novels. The sensational effectiveness and vigor of Jack London were exemplified this year in *The Star Rover*, where they were brought to the support of prison reform, and combined, with other qualities, to fashion a series of short stories which the idea of reincarnation binds into a single sheaf. This year brought forth also the same author's *The Scarlet Plague*, where we have a forecast of the world of the future lapsed into barbarism, which does not represent Mr. London at his best in theme or manner. Two stirring Western stories are Rex Beach's *Heart of Sunset*, a best-seller for 1915, crammed with the thrilling adventures of a shilling-shocker, and Zane Grey's *Lone Star Ranger*, also one of the year's best-sellers, and a lurid tale of the Texas border in the seventies, with abounding adventures among outlaws and rangers, punctuated by the exhilarating crack of the revolver. From Richard Harding Davis's practiced hand came *Somewhere in France*, in which that popular author applied his familiar method to fresh material, notably to an incident of the present war. Sinclair Lewis, who first appeared creditably with a novel last year, appeared again this year with his *Trail of the Hawk*, which goes about its varied business, East and West, with enlivening briskness, and displays qualities of vigor, invention, and clear-eyed observation that encourage the hope of better things from the same pen. What part of literature is now closed to the activities of feminism? Certainly not the hunting-ground of the detective, real or fictitious, witness Anna Katherine Green's *The Golden Slipper*, and Bertha Runkle's *Straight Down the Crooked Lane*, where two detectives of the fair sex ply their trade with eminent success.

POETRY. *English.* An increasing demand for poetical work in various kinds marks this year as it marked last year, and the world would appear willing, and waiting, to listen once more to the poet as to the voice of modern life. High among the lyrics of the year are those of the Irish poet, W. E. Russell—"Æ"—whose *Collected Poems* are rare and subtle verses that capture mystic moods in nets of lovely word and phrase to a music all their own. Katharine Tynan Hinkson, also an Irish poet, in *The Flower of Peace*, a volume of devotional verse, has the simplicity, freshness, and fine skill in words and music which commended her earlier volumes of poetry. Those who from the prose fantasies of James Stephen, another Irish singer, have drawn a favorable opinion of their author, will only imperil that opinion by making the acquaintance of the slender volume of lean lyrics entitled *The Rocky Road to Dublin*, which, remembering Blake and Stevenson, and aiming at childlike naïveté, achieve chiefly childishness and fatuity. Full of promise were *The Collected Poems of Rupert Brooke*, true poetry, sound and vigorous, and often of a finished art. The author of them died untimely in the war. In Laurence Binyon's *The Winnowing Fan*, we have a collection of war-time verses of manly and generous fibre; and in Alfred Noyes's *The Lord of Misrule*, all the poems, including war lyrics, that Mr. Noyes has



RUPERT BROOKE
Died April 23, 1915

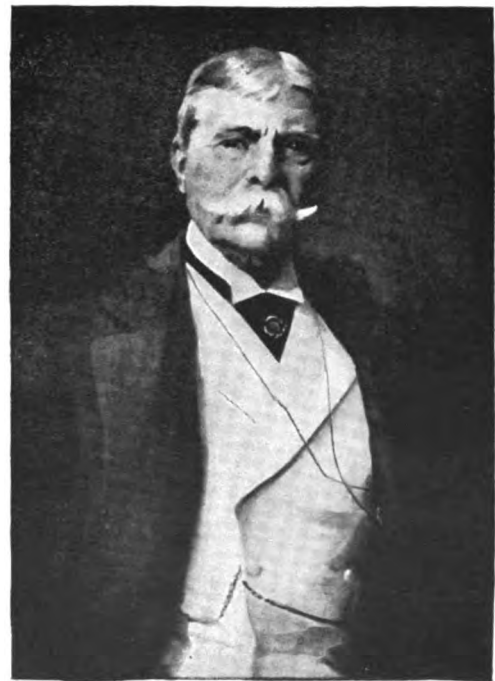


EDGAR LEE MASTERS
American Poet



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Canon JAMES OWEN HANAY
(George A. Birmingham)



F. HOPKINSON SMITH
Died April 7, 1915

FOUR AUTHORS PROMINENT IN 1915

written since his *Collected Poems* (1913), none of which will, however, add to his fame. This year G. K. Chesterton courted the muse with good, business-like verses in a kind of *omnium-gatherum* entitled *Poems*. The volume is thoroughly characteristic of his blustering optimism and orthodoxy, and his habit of striking an attitude. Not the least engaging feature of the book is the Rabelaisian portrait of the author with which it is embellished. Mgr. (R. H.) Benson's *Poems*, a slender sheaf, interesting rather as a personal revelation than as poetry, also made its appearance. Stephen Phillips (q.v.)—who died in the current year—was represented in 1915 by his ambitious *Armageddon*, a dramatic war poem in the Miltonic manner, in which mortals and immortals mingle, Satan and the spirit of Joan of Arc, and corps commanders of the belligerent nations being alike *dramatis personæ*—one more instance of the general failure in literature to voice the feelings that are sweeping over the nations engaged in the great conflict. The same author was represented again by his *Panama and Other Poems*, where he struck out some sparks of the old fire and brilliant imagery that made him famous.

American. Here several familiar names are conspicuous. From E. A. Robinson, than whom none of his compatriots is writing better poetry, came a revised and enlarged edition of his *Captain Craig*; from Percy Mackaye *The Present Hour*, concerned largely with the war, and the lyrical drama *The Immigrant*; from Clinton Scollard *The Vale of Shadows and Italy in Arms*; from Madison Cawein, posthumously, *The Cup of Comus*; from James Whitcomb Riley *The Old Soldier's Story*; from Cale Young Rice *Collected Poems*, in two volumes and more than 1000 pages. Among younger American poets several are more prolific and more widely known than John G. Neihardt, but in his best moments he can move and delight as well as the best of his craft; to 1915 belonged his *The Song of Hugh Glass*, a narrative poem of epic cast, with early Western frontier life on the Missouri as its theme. With his *Shoes of Happiness* Edwin Markham failed to arrive at any moment within measurable distance of his fine "The Man With the Hoe." Bliss Carman sustained his enviable reputation as a lyricist by the lyrics of his own composition in *Earth Deities and Other Lyric Masques* in which Mary Perry King was his collaborator. A distinguished little volume is *Japanese Lyrics*, which assembles translations by Lafcadio Hearn, characteristically Oriental in their swift, brief, vivid impressionism. No survey of this year's verse could forget Edgar Lee Masters's *Spoon River Anthology* which encloses the quintessence of a group of rural souls in its frank post-mortem appraisals of character and achievement, from whose searching truth the unctuous prevarications of conventional obituary and epitaph would shrink back aghast. In Mr. Masters's work as in that of several of the younger poets, there is a departure from the beaten track of regular prosody, and a break into the by-ways of free verse. This is not true, however, of the work of Thomas Walsh and Joyce Kilmer, who have no verse hobbies to ride, and who express themselves happily and without constraint in traditional poetic forms. Their two books, sufficiently different in spirit and manner, are, respectively, *The Pilgrim Kings*, poems throughout of a fine poetic texture, and with a

strong Catholic flavor, inspired often by Spanish art and the life of old Spain, and *Trees*, in which the themes are homelier and nearer home. Robert Frost's *North of Boston*, with its presentation, in verses rugged, homely, and direct, of New England life and character, made a marked impression. The lyrics of Miss Sara Teasdale—her *Rivers to the Sea* was of this year—were among the best of the 1915 harvest: they are commended by simple beauty of form, and by a steadfastness of feeling that contrasts favorably with the transitory fervors of certain fevered latter-day rhapsodists.

A poetic novelty, well to the front this year, and found on both sides of the sea, is provided by the "Imagist" poets, who seek, first of all, to convey their ideas and emotions through clear-cut imagery, abjuring the blurred and vaguely suggestive, and who, secondly, shaking free for the most part of the shackles of rhyme and regular meter seek to catch the rhythm of the speaking voice, with its breathing spaces, and to build their poems on the laws of cadence—whatever those laws may be. Startling by its extravagances, eccentricities, and general departure from the poetically decorous, "Imagism" may have sprung from a mood akin to that of the latest practitioners of novel techniques in painting and sculpture: the value of its contribution to art time will determine. Specimens of "Imagist" work, English and American, are in *Some Imagist Poets* (Boston), and a representative poet of the group is Miss Amy Lowell, whose *Sword Blades and Poppy Seeds* is of the present year.

To those who would follow the annual drift of American verse W. S. Braithwaite's *Anthology of Magazine Verse and Year Book of American Poetry* (New York) may be commended.

ESSAYS, LITERARY CRITICISM, AND CRITICAL BIOGRAPHIES. The harvest of essays for the two seasons of 1915 seems neither very plenteous, nor, on the whole, very noteworthy. Literary criticism and critical biographies were apparently more abundant and of better quality.

English. Each year brings one or more volumes from the pen of Arthur Christopher Benson, and 1915 brought *Escape and Other Essays*. Docile in spirit, mellow and urbane in style, this book still has, like some of its predecessors, a certain revolutionary aspect in scoring the English public schools for their worship of social standing and athletic prowess, and for their coolness toward things of the intellect. Nearer the centre of the troubled stream of the hour are the essays in G. W. E. Russell's *Spirit of England*, studies of the varied effects of the war upon Englishmen who remain at home or fight abroad. Prof. J. W. Mackail paid a tribute to one of England's allies in *Russia's Gift to the World*, an essay, compact, comprehensive, and knowledgable, on Russia's contribution to the world in letters, art, and science. Substantial and suggestive, as well as finished in form, is G. Lowes Dickinson's *The Civilizations of India, China, and Japan*. A fantastic satirical commentary on phases of the life of to-day, not forgetting the literary life, is *Boon: The Mind of the Race*, which may perhaps find place here as well as elsewhere. H. G. Wells provided its introduction, and to him, indeed, its authorship was confidently ascribed, though the title-page carried the name of Reginald Bliss. Underlying its irony and banter is the serious conviction that the world's hope is in the labors of its

writing men who strive to bring reason and order into our muddled life.

The generality of readers, with its limited and haphazard literary experience, is always at a loss for a just judgment regarding the merits of living writers, and their standing in the field of their special endeavor; hence the usefulness of critical biographies by those qualified to guide the bewildered man in the street through the contemporary labyrinth of letters—this apropos of the *Writers of the Day* series of little books, of which John Palmer's *Rudyard Kipling*, F. J. H. Darton's *Arnold Bennett*, J. D. Beresford's *H. G. Wells*, and W. L. George's *Anatole France* have already appeared; and apropos also of such more extended works as P. P. Howe's *Bernard Shaw*, Forrest Reid's *W. B. Yeats*, Miss Una Taylor's *Maeterlinck*, and F. A. Swinerton's *Robert Louis Stevenson*, which last work is hardly less than an antagonistic critical study, representing a reaction from the sustained chorus of praise we have heard so long.

American. A literary curiosity, and one certain of a welcome from those who know what fine and subtle criticism can add to the delights of the book lover, is Lafcadio Hearn's *Interpretations of Literature* (2 vols.). It consists of papers selected from a mass of notes taken in English, and as nearly verbatim as possible, from the lips of Hearn by Japanese students at the University of Tokyo to whom he was endeavoring to interpret English literature. The volumes are edited by Prof. John Erskine, who himself offered this year a volume of essays, full of pith and point, under the title *The Moral Obligation to be Intelligent*. Second to none among our literary critics, thanks to his scholarly equipment, his fine literary faculty, and his fruitful critical method is Paul Elmer More, who this year added to his *Shelburne Essays* the volume *Aristocracy and Justice*, a plea for an aristocracy of intelligence, a potent protest against our national vice of pandering to the multitude, and a call to men of superior intelligence to stand for their own without deference to popular notions or prejudices. Bent as of old upon epigram and paradox, and resolved to coruscate at any cost, James Huneker shows himself an accomplished and competent critic of the contemporary in its picturesque variety in *Ivory, Apes, and Peacocks*, a series of papers on poets, painters, playwrights, etc., most of them all palpitating with modernity. Richard Le Gallienne, whether in prose or verse a finished artist, brought out this year his *Vanishing Roads and Other Essays*. Miss Amy Lowell's *Six French Poets*, consisting of studies and translations, besides its general appeal to lovers of poetry, should appeal particularly to those interested in *vers libre* and to the practitioners of it at home and abroad. Out of the fullness of his ripe knowledge came William Winter's valuable *Shakespeare on the Stage*. Prof. Fred Lewis Pattee, in his *History of American Literature Since 1870*, covered a field never before attempted in a single volume, and in so doing wrote a book full of vitality, bristling with ideas, and quite unacademic in temper and point of view, which will doubtless have to be reckoned with by all literary historians who in future busy themselves with the period in question. Clayton Hamilton's devotion to Stevenson found expression in his attractive *On the Trail of Stevenson*, which follows R. L. S. over the world, up to the time he left for

the South Seas, and gleans many fresh and interesting bits of reminiscence. Notable scholarly books of mingled biography and criticism are Prof. George Lyman Kittredge's *Chaucer and His Poetry*, Prof. William Lyon Phelps's *Browning: How to Know Him*, Prof. Bliss Perry's *Carlyle: How to Know Him*, O. W. Firkin's *Emerson*, the late Prof. Thomas Lounsbury's *Life and Times of Tennyson*, and Prof. J. McClean Harper's *Life of Wordsworth*.

HISTORY, GENERAL BIOGRAPHY, AND MEMOIRS. During the year historians turned their attention largely, as was said, to occasional works concerned in one way or another with the war. For all that, there remains a goodly number of important histories unconcerned with that absorbing topic, while the biographies of 1915 are alone sufficient to give the year distinction in literary annals.

English. A new book of importance in this department was Sir Percy Sykes's *A History of Persia* (2 vols.), which fills the long felt want of an authoritative and up-to-date work in its field. Its author lived for more than a decade as a British official in Persia, and the excellence of these volumes puts them in the front rank of recent histories dealing with the Orient. In *The Partitions of Poland* Lord Eversley wrote a tragic page of modern history, and in *High Lights of the French Revolution* Hilaire Belloc provided a series of vivid historical essays on a subject in which he was perfectly at home. This year witnessed the appearance of an English edition of the new Lingard's *History of England* in 11 volumes, the last volume, by Mr. Belloc, bringing the work down to the European war. Its standpoint is Roman Catholic. From Ronald A. Hall came *Frederick the Great and His Seven Years' War*; from J. A. Williamson *Maritime Enterprise, 1485-1588*, a sound work of substantial value; from Joseph McCabe *Crises in the History of the Papacy*; and from G. F. Scott Elliott a history of the pre-historic entitled *Pre-Historic Man and His Story*. Contributions to the field of history include also C. L. Kingsford's *The Grey Friars of London*, and A. H. Johnson's *History of the Worshipful Company of the Drapers of London*—searching and competent studies both of them; and P. H. Brown's *Legislative Union of England and Scotland*.

Beckles Willson's *Life of Lord Strathcona* is a book of prime importance—virtually an inner history of Canada for many of the years it covers, with the value attaching to a work which is both a biography and a significant page of history. Another solid contribution to historical-biographical literature is Algernon Cecil's biography of his distinguished ancestor, *A Life of Robert Cecil, First Earl of Salisbury*; and still another, R. B. Cunningham's *Life of Bernal Diaz del Castillo*, concerned with one of the heroes of the conquest of Mexico. A new biographical series published on both sides of the sea is *Makers of the Nineteenth Century*, which opens with Sir E. T. Cook's *John Delane*, Lord Charnwood's *Lincoln*, and Hugh S. Elliott's *Herbert Spencer*. Mrs. Russell Barrington's *Life of Walter Bagehot* is included in the new 10-volume edition of Bagehot's works which appeared this year. Among letters, reminiscences, and the like, *Emma Darwin: A Century of Family Letters* will be prized for what it tells of the great naturalist and his family and familiar circle.

The spice of wit enlivens the information about men and affairs which Lord Alverstone's *Recollections of the Bar and Bench* affords. Lieut.-Gen. Sir Robert Baden-Powell writes of his sporting adventures, soldiering, and travels in India in his *Memoirs of India*, while interesting pages from the book of quite another life, comprise the *Reminiscences and Letters of Sir Robert Ball*, begun by the astronomer-author himself and completed, after his death, by his son. Sir Edwin Pears's *Forty Years in Constantinople* is not least interesting where it bares the hidden springs of many important political events in Turkey. To the limited list of good English biographies of French Revolutionary leaders was added E. D. Braby's *Life of Barnave* (2 vols.).

American. This year a new history of the United States appeared, *The Riverside History*, in four volumes—Carl Becker's *Beginnings of the American People*, Allen Johnson's *Union and Democracy*, William E. Dodd's *Expansion and Conflict*, and Frederic L. Paxton's *The New Nation*. George Bird Grinnell summed up the results of long labor in writing the first full history of a typical Indian tribe in *The Fighting Cheyennes*. An avowed—and interesting—continuation of Colonel Roosevelt's *Winning of the West* was Prof. Robert M. McElroy's *Winning of the Far West*. Prof. Morris Jastrow turned attention to the East in his important work, *Civilization in Babylonia and Assyria*, as did David Paton in *Egyptian Records of Travel in Western Asia*. The tragic history of *The Jews in Russia and Poland* is related by Prof. Israel Friedlander, who brings into relief in the course of his narrative the crushing disabilities which Christendom has laid upon the Jewish race in one part of Europe. A significant page of American history, written with authority, is Major-General Goethals's *The Building of the Panama Canal*. Looking backward, Henry Fairfield Osborne gleams facts and inferences concerning prehistoric man and his way of life in *Men of the Old Stone Age*. A *History of American Diplomacy* was written by Prof. Carl Russell Smith; a *History of Travel in America*, a work of patient industry and abundant documentation, by Seymour Dunbar; *The California Padres and Their Missions*, by C. F. Saunders and J. S. Chase; and *The Normans in Europe*, a masterly work of scholarly popularization, by Prof. C. H. Haskins.

There was a fine harvest in 1915 in the field of American biography and kindred works. Two excellent biographies of contrasting types were William Roscoe Thayer's *Life and Letters of John Hay*, and Dean Hodge's *Life of Henry Codman Potter*. In the first, Mr. Hay was permitted for the most part to tell his own story expansively in letters; in the second, the author made his own concise synthesis of biographical data and wrote a book excellent in its kind. Tardily came the *Life of Clara Barton*—the first *Life*—by her friend, Percy H. Epler; tardily, also, W. B. Parker's *Edward Rowland Sill*; and, more tardily than either, the two volumes of *Letters of Washington Irving to Henry Brevoort*—nearly half the letters hitherto unpublished—edited by George Hellman. An autobiographic volume sure of a permanent place in the literature of the feminist movement in America is Dr. Anna Howard Shaw's *The Story of a Pioneer*, the record of the extraordinary career of a woman

who was thrice a pioneer—in the healing art, as a preacher, and as a suffrage propagandist. The monumental and perferdily anti-English *Thomas Addis and Robert Emmet* (2 vols.) is, so far at least as facts go, a definitive work of unsparing industry from the hand of Dr. Thomas Addis Emmet.

The Adams prize of the American Historical Association went this year to a woman, Miss Violet Barbour, on the score of her *Henry Benet, Earl of Arlington*, notably interesting in its study of foreign relations in the reign of Charles II. Valuable side-lights on American history were thrown from David Duncan Wallace's *Life of Henry Laurens*, a well-nigh forgotten Revolutionary worthy. Reminiscences from four men conspicuous in different fields of American endeavor were William Dean Howells's *Years of My Youth*, covering the part of Mr. Howells's life prior to his Venetian consulate; George Haven Putnam's *Memoirs of a Publisher*, international recollections not confined to the author's circle of business, or professional, activity, and supplementing his earlier *Memoirs of My Youth*; Lyman Abbott's *Reminiscences*; and William Winter's *Vagrant Memories*, rich in delightful reminiscences, in solid criticism of things dramatic and theatrical, and in sage reflection.

TRAVEL AND DESCRIPTION. English. Of outstanding interest among books of travel was *The Voyage of Captain Scott*, by Charles Turley, based upon the books and diaries of the ill-fated Arctic explorer. A notable work, too, was Alan Letherbridge's *The New Russia: From the White Sea to the Siberian Steppes*, as was also Oscar Brilliant's *Roumania*. Abounding in interesting pictures of Egyptian life, especially at Alexandria, and in side-lights on contemporary Egyptian history, was Baron Samuel Selig de Kusel's *An Englishman's Recollections of Egypt*, a book from a man who was long in the service of the Egyptian government, rising to the post of Controller-General of Customs, and who knew whereof he spoke. Norman Douglas, a ripe scholar, but no pedant, who has traversed all parts of the country of which he writes in *Old Calabria*, offered a well-digested work, compact of interesting information, and based upon a familiarity with the range of literature on his subject, ancient and modern. It is through ways of pleasantness and haunts of ancient peace that Ernest C. Pulbrook's *The English Countryside* leads us, its author the while discoursing in a most agreeable and informing manner. An accomplished man of letters, and withal something of an antiquarian, humorist, and poet, all in one, is Stephen Gwynn, who proved a model cicerone in *Famous Cities of Ireland*, a distinguished book in its class. An English journalist, Henry C. Shelley, whose pen was for years busy in this country in the way of his craft, sought to give his countrymen some notion of our manners, customs, history, and appearance in his well-informed *America of the Americans*. In England, as in the United States, a lively interest in South America was manifested this year, notably, by W. H. Koebel's *The South Americans*, a study of the distinctive traits of the people of the republics to the south of us, and of their way of life; by J. A. Hammerton's *The Real Argentina*, a book fresh and original, neither the impressionistic tale of a traveler, nor a mere compilation of old material; and by W.

A. Hirst's useful and comprehensive ready-reference *Guide to South America*.

American. This year added a number of books to the rapidly increasing store of works designed to open South America to the traveler, or to him who would buy, sell, or invest. Of such are Roger W. Babson's *The Future of South America*, which considers its subject from the commercial rather than the picturesque or historic standpoint; William E. Auginbach's *Selling Latin America*, dealing specifically with problems of salesmanship; Edward Ross's *South of Panama*, which aims to interpret to Americans the character and life of their South American neighbors; and *Latin-America*, 29 lectures on a wide range of themes, edited by G. Hubbard Blakelee. Here may also be mentioned Robert Bacon's *For Better Relations with Our Latin-American Neighbors*, and—a work of a different sort—Bernard Moses's *The Spanish Dependencies of South America*. The difficulties of travel abroad have naturally led to an increase in the number of books of travel and description concerned with America. Among such are: *California, Romantic and Beautiful*, by George Wharton James; *Highways and Byways of New England*, by Clifton Johnson; *Old Roads from the Heart of New York*, by Sarah Comstock; *Old Seaport Towns of New England*, by Edwin M. Bacon; *The Rocky Mountain Wonderland*, by E. A. Mills; *We Discover New England*, by Louise Closser Hale; E. Alexander Powell's account of his travels from New Mexico to British Columbia entitled *The End of the Trail*; and the late John Muir's *Travels in Alaska*, an absorbing book by the famous naturalist and explorer. Conspicuously good in its class is H. G. Dwight's *Constantinople, Old and New*, happily conveying to the reader the picturesque charm of the Turkish capital, a book vividly impressionistic in kind, but carrying with it a varied store of accurate information and observation at first hand. In his *France, Old and New: An Ideal Tour*, Francis Miltoin wrote in a way to assist and inform the traveler or motorist in going over ground with which he himself was thoroughly familiar.

RELIGION AND THEOLOGY. *English and American.* A work of intrinsic value by a distinguished author is the Rt. Hon. Arthur James Balfour's *Theism and Humanism*. Prof. Herbert Allen Giles of Cambridge dealt with the principles and practice handed down by Confucius, in *Confucianism and Its Rivals*, at once a work of scholarship, and the most interesting account of its subject for the general reader. From Lewis Spence came *The Myths of Ancient Egypt*; from J. N. Farquhar *Modern Religious Movements in India*; from Sir W. M. Ramsay *The Bearing of Recent Discoveries on the Trustworthiness of the New Testament*; from Prof. James Ten Broeke *A Constructive Basis for Theology*, a stimulating book, vigorously Protestant in method and ideas; from Dr. Henry Sloane Coffin *Some Christian Convictions*; from Dr. Cassius J. Keyser *The New Infinite and the Old Theology*; and from Prof. James Stalker *Christian Psychology*. C. J. G. Montefiore, great-nephew of Sir Moses of that name, in a spirit loyal to his ancestral faith, made a genuine contribution to an understanding of Pauline religious ideas in *Judaism and St. Paul*. Stephen Graham's *The Way of Martha and the Way of Mary* is in large measure a study of the religion of Russia in comparison

with the religion of western Europe. A series of reflections on the comparative study of religions was offered by Stanley Arthur Cook in *A Study of Religion*. Among the theories or doctrines discussed by Prof. Douglas Clyde in his *The Problem of Knowledge* are dualism, agnosticism, idealism, and pragmatism. A sweeping survey of modern theological thought, especially in Great Britain and Germany, was made in Dr. William Henry Clark's *Liberal Orthodoxy*. Religion attends to conduct and practical affairs in Prof. A. T. Robertson's *Practical and Social Aspects of Christianity*; in Lionel Spencer Thornton's *Conduct and the Supernatural*, a plea for Christian ethics; in William F. Badé's study of the development of the moral sense as shown in the Bible, entitled *The Old Testament in the Light of To-day*; and in Archdeacon Cunningham's *Christianity and Politics*.

FEMINISM. The stream of books on this important subject increases in volume from year to year. Some notable 1915 books in this group are: Martha F. Crowe's *The American Country Girl*, which deals with problems of the young woman on the farm; Anne Morgan's *The American Girl*, treating, notably, of her education, her recreation, and her future; Katharine Susan Anthony's *Feminism in Germany and Scandinavia*, which seeks to bring the woman's movement in the countries named in the title of her book into closer touch with that movement in the English-speaking countries; *The Marriage Revolt*, a study of marriage and divorce, by William E. Carson; a history of trade unionism for working women, *The Trade Union Woman*, by Alice Henry; Ida M. Tarbell's conservative little volume, *The Ways of Woman*; an interpretation of the woman's movement by Beatrice Forbes-Robertson, entitled *What Women Want*; a work by James Lichtenberger, *Women in Public Life*; and Dr. Anna Howard Shaw's important autobiography, *The Story of a Pioneer*, already mentioned.

LITTLE, GEORGE THOMAS. American librarian, died Aug. 5, 1915. He was born in Auburn, Me., in 1857, and graduated from Bowdoin College in 1877. He taught Latin in several schools until 1883, when he was appointed librarian of Bowdoin College. He served in this capacity until his death. He was a member of the Maine State Library Commission, and was the author of *Descendants of George Little of Newbury, Mass.* (1882); and *History Sketch of Bowdoin College from 1794-1894* (1894).

LITTLEFIELD, CHARLES EDGAR. Member of Congress from Maine, died May 2, 1915. He was born in Lebanon, Me., in 1851, and was educated in the public schools. After working as a carpenter and millwright, he studied law and was admitted to the bar in 1876, beginning practice in Rockland. He soon made a reputation which brought him into politics. He served in the Legislature of 1875 and was Speaker of the House in 1878. In the same year he was elected Attorney-General of the State. On June 19, 1899, he was reelected to serve out the unexpired term of Nelson Dingley. He was reelected to the 56th, 57th, 58th, 59th, and 60th Congresses. He was selected by President Roosevelt as an aid in carrying out the anti-trust legislation. An anti-trust bill which he prepared passed in the House in 1903. It did not, however, pass in the Senate. Mr. Littlefield opposed President McKinley's Porto Rican policy,

and was also in opposition to President Roosevelt in regard to Cuban reciprocity. In 1906 his election was opposed by Samuel Gompers, the president of the American Federation of Labor. Mr. Littlefield was, however, elected. Shortly after he resigned and moved to New York, where he formed a law partnership with his son. He appeared as counsel in many prominent cases.

LIVE STOCK. See STOCK RAISING AND MEAT PRODUCTION.

LIVING, COST OF. See FOOD AND NUTRITION.
LOAN AND TRUST COMPANIES. See STATE BANKS; BANKS AND BANKING.

LOAN OF VICTORY. See FINANCIAL REVIEW, *France*.

LOAN SHARKS. The agitation of recent years against the unscrupulous lenders of money on the basis of salaries or chattel mortgages on household furniture has resulted in very marked diminution of a serious evil. Extensive legislation in many States has brought these lenders of small sums to the poor under regulation and supervision. The tendency of such legislation was to permit a rate of interest of 3 per cent per month without any fees whatever; to require the licensing and bonding of loan agencies under the supervision of the State; to require the lender to give each borrower a complete statement of the terms of the loan together with a copy of the law regulating charges; and to fix adequate fines and imprisonment for violations.

NATIONAL FEDERATION OF REMEDIAL LOAN ASSOCIATIONS. This federation held its seventh annual convention in May, 1915. About 20 constituent societies were represented. The annual report of the federation showed that it was composed of 40 societies operating in 35 cities in 20 States and the Province of Ontario; and that they employed about \$17,000,000 in making small loans at reasonable rates. While in no sense a charitable undertaking, these societies do not admit to membership any association which does not limit its dividends in accordance with the investment standards of its own community. The federation actively assisted in securing legislation in 1915, in Oregon, Nebraska, Iowa, Texas, Michigan, Ohio, Pennsylvania, and New York.

RUSSELL SAGE FOUNDATION CREDIT UNIONS. Partly as an outgrowth of the severity of the unemployment situation in New York in the winter of 1914-15, the Russell Sage Foundation and the Mayor's Committee on Unemployment organized a credit union with a capital of \$250,000. The plan was for this parent union to serve as a nucleus for the formation of local credit unions. Such unions would be coöperative, with joint liability of all members, the bond of association being the neighborhood relationship or membership in church, club, lodge, labor union, or other organization. It was pointed out that Massachusetts in 1909, and New York, Wisconsin, and Texas in 1914, had authorized the formation of credit unions; and that Jewish farmers had a number of credit unions in successful operation (see AGRICULTURAL CREDIT). Moreover, it was estimated that there are more than 65,000 credit unions throughout the world with 15,000,000 members and doing an annual business of \$7,000,000,000. It was believed that these unions would stimulate thrift, develop a spirit of coöperation, and prevent worthy families from sinking into destitution in times of need.

MORRIS PLAN BANKS. Another important development in this field has been that of the Mor-

ris Plan banks, which were called "the nemesis of the loan shark." These are promoted by the Industrial Finance Corporation formed in 1914 with \$7,000,000 capital. The men behind this corporation included Vincent Astor, Oscar S. Straus, Nicholas Murray Butler, Clark Williams, Herbert L. Satterlee, Henry R. Towne, Theodore B. Shonts, Willard Straight, and other distinguished financiers and publicists. These banks are named from Arthur J. Morris of Norfolk, Va., who in 1901 began providing banking facilities on a small scale for workingmen and others of small means. The plan provides for loans of small amounts, either on collateral or on notes signed by the borrower and two friends. When collateral is given only the legal rate of interest is charged; and in the other case an additional charge of \$1 for each \$50 loaned is made to cover the cost of investigating endorsers. In addition, individuals may purchase installment certificates by weekly or monthly deposits which may be exchanged in multiples of \$50 for investment certificates bearing 5 per cent interest. By the close of 1915 there were 29 or 30 of these banks in the United States. Up to November 3rd they had loaned \$11,500,000 to 91,500 persons. The losses of these banks in 1914 from bad loans amounted to less than one-tenth of 1 per cent of the loans; and their net profits were 7.8 per cent of their capital. An injunction was sought by the Universal Savings Corporation of Norfolk, Va., against the further development of these banks on the ground that David Stein, president of the Universal, was the real author of the Morris Plan of industrial banking. This suit was similar to one brought by Mr. Stein against Mr. Morris and the Fidelity Corporation of America at Norfolk in 1914. That suit was dismissed, but an appeal was taken. The Fidelity Corporation was merged with the Industrial Finance Corporation.

FREE SYNAGOGUE LOAN FUND. A committee of the Free Synagogue in New York, headed by Dr. Stephen S. Wise, provided a fund of \$5800 which was loaned to worthy families in need of aid on account of unemployment. From January to April 1st, 362 loans were made to 106 applicants. Most of the wage earners had been out of work for from three to six months; and in some cases every article of value in the homes had been sold or pawned. Of the 106 families, 69 required only temporary help, their average borrowings being only \$30. This experiment was believed to indicate that there were thousands in the city constantly on the verge of dependency, and that the margin between self-support and dependency could be measured by such small sums as \$25 or \$30.

LOCKE, W. J. See LITERATURE, ENGLISH AND AMERICAN, *Fiction*.

LOCKJAW. See TETANUS.

LOCKS. See CANALS.

LOCOMOTIVES. See RAILWAYS.

LOEFFLER, FRIDRICH. German scientist, died April 9, 1915. He was born at Frankfort-on-the-Oder in 1852. He achieved fame in 1884 when he gave a systematic description of what is known as the Klebs-Loeffler bacillus, which was afterward proved to be the "causa causans" of diphtheria. In 1910 he, together with Professors Koch and Gaffky, conducted an investigation which formed the foundation of the modern steam disinfection process. He also made the discovery of the "mice typhoid," which

proved to be the most useful factor in the removal of the mice plague. He was the author of many important treatises on diphtheria and malaria.

LONDON. See GREAT BRITAIN.

LONDON, JACK. See LITERATURE, ENGLISH AND AMERICAN, *Fiction*.

LONDONDEBRY, CHARLES STEWART HENRY VANE-TEMPEST-STEWART, Marquis of. English nobleman, died Feb. 8, 1915. He was born in London in 1852, and educated at Eton, and Christ Church College, Oxford. He succeeded to the title on the death of his father in 1884. Two years later he was made Viceroy of Ireland, and was one of the strongest opponents of the Gladstone Home Rule Bill of that year. On the passage of the Home Rule Bill in 1914 Lord Londonderry was one of the strongest advocates for armed resistance, if the issue came to that point. He held several offices and from 1902 to 1905 was president of the Board of Education. He was lord president of the Council from 1903 to 1905. Lord Londonderry was one of the great landholders of England, owning more than 50,000 acres. He was always a Conservative in politics and made a reputation also at the bar. He married in 1875 the oldest daughter of the Earl of Shrewsbury.

LONG, JOHN DAVIS. American lawyer and public official, died Aug. 28, 1915. He was born in Buckfield, Me., in 1838, and graduated from Harvard University in 1857. For several years following he taught school. Afterwards he studied law at the Harvard Law School, and was admitted to the bar in 1861. After practicing for one year in Buckfield he moved to Boston. He entered politics and in 1871 was an independent candidate for the State Legislature, but was beaten. Three years later he was elected to the House of Representatives, and his ability and popularity were so marked that he was reelected and chosen as Speaker of the House. He held this position until 1878, when he was elected Lieutenant-Governor. In the following year he defeated Benjamin F. Butler for the governorship of the State and was reelected in 1880 and 1881. In 1882 he was elected to the 48th Congress, and was twice reelected. In 1888 he declined renomination. He was a candidate for the United States Senate, but was defeated by Senator Dawes. He returned to his law business, and soon built it up to a remarkable degree, enjoying one of the largest and most lucrative practices in and around Boston. In 1897 he accepted the invitation of President McKinley to become Secretary of the Navy in his cabinet. He held this office until March, 1902, continuing for some time under President Roosevelt. His intention was to leave the latter's cabinet, but he remained because of his desire to see the Schley case disposed of while he was in office. As soon as his policy in that controversy was sustained by President Roosevelt, Mr. Long retired to private life. In addition to his ability in politics he was a scholar of considerable attainments. In 1879 he published a translation of Vergil's *Æneid*. During his youth he wrote some poetry. He was remarkable for his parliamentary ability, his judgment as a lawyer and statesman, his high moral character, and his great geniality and democracy. He was for many years a member of the Massachusetts Total Abstinence Society, was also a leader of many peace conferences and societies, and was a member of several

learned societies, including the American Academy of Arts and Sciences. His published writings include, in addition to those mentioned above: *After Dinner and Other Speeches*; *The Republican Party—Its History, Principles, and Policies, 1899–1902*; and *The New American Navy*.

LORENZELLI, BENEDETTO. Italian Cardinal, died Sept. 16, 1915. He was born in Bati, Italy, in 1853. After entering the priesthood he was continually in the diplomatic service of the Vatican, until he was created cardinal on April 15, 1907. He was papal nuncio at Paris, immediately preceding the breaking off of diplomatic relations between the Vatican and the French government over the Associations' law. Among the other diplomatic posts which he occupied were those at The Hague, and Munich. In 1904 he was made Archbishop of Lucca, and prefect of the Congregation of Studies.

LOUISIANA. The estimated population of the State on July 31, 1915, was 1,801,306. The population in 1910 was 1,656,388.

AGRICULTURE. The acreage, production, and value of the principal crops, estimated by the United States Department of Agriculture in 1914–15, were as follows:

		Acreage	Prod. Bu.	Value
Corn	1915	2,200,000	45,100,000	\$28,864,000
	1914	2,000,000	38,600,000	28,950,000
Oats	1915	120,000	8,000,000	1,650,000
	1914	70,000	1,810,000	1,014,000
Rice	1915	401,000	13,714,000	12,343,000
	1914	386,500	10,802,000	10,046,000
Potatoes	..1915	28,000	1,428,000	1,357,000
	1914	24,000	1,680,000	1,680,000
Sweet Potatoes	.1915	65,000	5,980,000	2,990,000
	1914	69,000	5,183,000	3,285,000
Hay	1915	250,000	a 438,000	4,511,000
	1914	200,000	880,000	4,560,000
Tobacco	...1915	800	b 126,000	88,000
	1914	700	280,000	98,000
Cotton	1915	1,090,000	c 360,000	19,289,000
	1914	1,299,000	449,000	14,820,000

a Tons. b Pounds. c Bales.

LIVE STOCK. The United States Department of Agriculture estimated that on Jan. 1, 1916, and Jan. 1, 1915, horses numbered 193,000 and 191,000, valued at \$15,826,000 and \$15,853,000; mules numbered 132,000 and 132,000, valued at \$15,972,000 and \$16,500,000; milch cows numbered 271,000 and 268,000, valued at \$10,027,000 and \$9,648,000; other cattle numbered 475,000 and 448,000, valued at \$7,980,000 and \$7,347,000; sheep numbered 185,000 and 180,000, valued at \$426,000 and \$396,000; swine numbered 1,553,000 and 1,412,000, valued at \$11,337,000 and \$10,872,000. The production of wool in 1915 and 1914 was 560,000 and 536,000 pounds, respectively.

In 1914 the amount of sugar cane ground for sugar was 3,199,000 tons, producing 242,700 short tons. The amount of cane to be ground in 1915 was estimated at 2,000,000 short tons.

MINERAL PRODUCTION. The output of petroleum in Louisiana in 1914 amounted to 14,309,435 barrels, valued at \$12,886,897, exceeding the output of 1913 by 1,810,607 barrels. This established a new record for oil petroleum in the State. The increase came entirely from the productive district in the northwestern portion, which furnished 11,808,469 barrels, compared with 2,500,966 barrels from the coastal pools. The average price per barrel for the entire pro-

duction of the State declined from 98 cents in 1913 to 90 cents in 1914. In spite of low prices the total value of the State's oil production in 1914 was more than \$500,000 in excess of the value in 1913. During the year a total of 566 wells were drilled, of which 374 yielded oil. The total value of the mineral products in 1914 was \$21,890,025.

EDUCATION. The latest statistics for education in the State are for 1914. In that year the total school population was 528,268. The total enrollment was 288,912, and the average daily attendance 199,103. The male teachers numbered 1361, and female teachers 5491. The average monthly salary of males was \$80.87, and of females, \$58.70.

FINANCE. The latest report of the State treasurer is for the fiscal year 1913. The total receipts of that year were \$8,203,465, and the disbursements amounted to \$7,365,208, leaving a balance on hand at the end of the year of \$1,002,174, which included a balance at the beginning of the year of \$850,025.

CHARITIES AND CORRECTIONS. The State institutions include: an Institution for the Deaf and Dumb at Baton Rouge, Institute for the Blind at Baton Rouge, Soldiers' Home at New Orleans, Insane Asylum at Jackson, Charity Hospital at New Orleans, Charity Hospital at Shreveport, and a State Penitentiary and Convicts' Farm.

TRANSPORTATION. The total mileage of single track line in the State in 1914 was 5232, of which 3839 was main line single track. Railways having the longest mileage are the St. Louis, Iron Mountain, and Southern, 462; Texas and Pacific, 339; Louisiana Railway and Navigation Line, 303; New Orleans, Texas, and Mexico, 202.

POLITICS AND GOVERNMENT. The Legislature was not in session in 1915. In a decision of the Supreme Court, rendered on March 23rd, reading of the Bible and recitation of the Lord's Prayer in the opening of the public schools in Caddo Parish were prohibited. The case was brought by persons of the Catholic and Jewish faiths, and arguments before the court were based on religious views. During 1915 more than \$4,500,000 was expended in an effort to make New Orleans rat proof, and to prevent the reappearance of the bubonic plague. Citizens expended approximately \$3,861,000 on their property, while Federal, State, and city governments spent more than \$600,000.

STATE GOVERNMENT. Governor, Luther E. Hall; Lieutenant-Governor, Thomas C. Barrett; Secretary of State and Insurance Commissioner, Albert E. Herbert; State Treasurer, Ledoux E. Smith; Auditor, Paul Capdevielle; Supervisor of Public Accounts, William N. McFarland; Superintendent of Public Instruction, Thomas H. Harris; Adjutant-General, Oswald W. McNeece; Commissioner of Agriculture, E. O. Bruner; Commissioner of Labor and Statistics, William McGillvray.

JUDICIARY. Supreme Court: Chief Justice, Joseph A. Breaux; Associate Justices, Walter B. Sommersville, A. D. Land, Frank A. Monroe, O. O. Provosty, Charles A. O'Neil.

STATE LEGISLATURE. Both houses are Democratic, except two Progressives.

LOUNSBURY, THOMAS RAYNSFORD. American scholar and educator, died April 9, 1915. He was born in Ovid, N. Y., in 1838, and grad-

uated from Yale College in 1859. From 1860-62 he was on the editorial staff of the *American Encyclopædia*. He served in the 126th New York volunteers from 1862-65, and in 1870 was appointed instructor in English at the Sheffield Scientific School, and from 1871 until his death was professor of the English language and literature at that school. From 1873-1906 he was librarian of the Sheffield Scientific School. Professor Lounsbury was one of the best known writers on English language and literature. He contributed for years notable articles on proper usages in English to important magazines. He received degrees of LL.D. and L.H.D. from Lafayette College and Princeton University. His published writings include: *The History of the English Language* (1879, 1894); *Studies in Chaucer* (1891); *Shakespeare as a Dramatic Artist* (1891); *The Standard of Pronunciation in English* (1904); *The Standard of Usage of English* (1908); *English Spelling and Spelling Reform* (1909); *The Early Literary Career of Robert Browning* (1910). He edited the complete writings of Charles Dudley Warner with a biographical sketch in 1904.

LOW TEMPERATURE RESEARCH. See CHEMISTRY.

LUBLINITE. See MINERALOGY.

LUDLOW, NICOLL. American rear admiral, retired, died Dec. 9, 1915. He was born in Islip, L. I., in 1842. He entered the Naval Academy in 1859. From 1863-64 he was attached to the sloop *Wachusett*, which captured the Confederate cruiser *Florida* in the harbor of Bahia, Brazil, on Oct. 7, 1864. In 1895 he was made captain. A year later he became involved in a controversy with the naval department, which resulted in the refusal of President Cleveland to approve the recommendation of the navy board, that he be promoted. During the Spanish-American War he commanded the *Terror*, attached to the Atlantic fleet. After Captain Hobson had been captured, in consequence of his attempt to bottle up the enemy's fleet in Santiago harbor, Captain Ludlow sailed from Key West for Hobson, when an exchange of prisoners had been arranged. After the war he was placed in command of the *Massachusetts* and had charge of that vessel when she grounded on Diamond Reef, near New York City. As the consequence of this accident, Captain Ludlow was reprimanded for negligence. He was finally promoted to the rank of rear admiral, and in 1904 was appointed governor of the Navy Home in Philadelphia. He retired on July 8, 1899.

LUETIN. An extract made from killed cultures of *treponema pallidum*, the causative organism of syphilis. It is widely employed for the diagnosis of this disease, to reinforce or control the Wassermann diagnostic test. When injected into (not under) the skin of a normal individual no reaction occurs, except a small red area around the puncture. In syphilitic individuals the reaction consists of a crop of papules which later may become pustules, and in very positive reactions a large reddish induration appears in 24 to 48 hours, slowly increasing for 4 or 5 days, and then gradually disappears, the papule becoming dark bluish red. Luetin is most useful in the diagnosis of hereditary, latent, and tertiary cases; primary or untreated secondary cases rarely give a positive reaction. An important feature is that luetin will give a positive reaction in patients who are under

treatment by mercury or salvarsan, whereas the Wassermann reaction is apt to be negative.

LUNACY. See **INSANITY.**

LUND, TROELS. Danish writer, who in 1915 received a third of the Nobel Prize for work in literature. He was born in Copenhagen in 1830, and after studying theology abandoned it for the study of history. His first work, which appeared in 1871, was a *Biography of Socrates*, which gave him a great reputation among scholars. He was assistant in the Danish Archive Department from 1870-75, and after this was an instructor of history in a military school in Copenhagen. In 1888 he was made full professor of history, and from that time has written a number of scholarly volumes chiefly relating to the subject of Scandinavian history in the sixteenth century.

LUSITANIA. The entire civilized world was shocked on May 7, 1915, to learn that the Cunard mail steamship *Lusitania*, on her voyage from New York to Liverpool, had been torpedoed by a German submarine some miles south-southwest of the Old Head of Kinsale. While this and similar acts were stated by the Germans to be in the way of reprisal for the blockade policy and the shutting out of food and other necessary supplies from their country, nevertheless in its heartlessness and its violation of all principles of international law, it occasioned universal horror, in which all the world save the Teutonic allies participated, and even by many Germans it was deplored, though considered justifiable on the score of military necessity. The *Lusitania* left New York on May 3, 1915, carrying 290 first-class passengers, 599 second-class, and 351 third-class, and a crew of 677, making a total of 1917 persons on board. Of these 765 were saved, so that the casualties due to the explosion of the torpedo and drowning numbered 1152. Before the liner sailed from America, advertisements emanating from the German Embassy, and announcing that a state of war existed, and warning passengers traveling on belligerent ships, were published in a number of important American papers, while anonymous communications were received by at least some of the more noted passengers who had booked for the trip. An ordinary cargo was taken aboard, with a certain amount of munitions of war in the form of cartridges and similar supplies, but no high explosives, guns, or loaded shells, and no guns were mounted on the vessel. The voyage was uneventful until the Irish coast was approached, when Captain Turner of the Cunard liner *Aquitania*, in command of the *Lusitania* on this voyage, received a wireless message from the Admiralty warning him of the presence of German submarines off the Irish coast, and of the sinking of a schooner on the previous day, giving certain instructions as to proceeding, which the captain testified he had followed out. Double lookouts kept special watch for submarines, but none were seen, and a zigzag course was not started or other precautions taken. No patrol boats were sent out by the Admiralty to meet the *Lusitania*, and except for the general feeling of apprehension and suspicion there were no unusual circumstances in connection with the approach to the coast at a speed of about 18 knots. At quarter past two in the afternoon the second officer called from the bridge: "There is a torpedo!" and the torpedo was seen by Captain Turner from the lower bridge. Almost immediately

afterwards the torpedo struck, and an explosion took place, the torpedo probably striking No. 3 or No. 4 boiler room, though possibly the engine room also was affected. After the main explosion a second explosion occurred, thought to be due to the bursting of the main steam pipe, and the turbines were immediately put out of commission, but the ship, badly torn and damaged, proceeded under her own momentum until she sank, which was 2:26½ P. M.—noted as the time when the captain's watch stopped—or less than 15 minutes from the blow. Immediately after the explosion the ship's crew proceeded to launch the lifeboats with no great excitement, and, as was stated, with reasonable promptness, but the list to starboard and the forward motion of the ship acted to prevent promptness, and many, in addition to those injured by the explosion, were unable to gain the lifeboats.

The submarine, according to all testimony, gave absolutely no warning before discharging its torpedo, neither coming to the surface nor hoisting its flag. It did not remain in the vicinity of the catastrophe, and the work of rescuing those swimming and in boats was carried on by coast guard and fishing vessels. The passengers rescued were brought to Queenstown and an inquest was held by the local coroner, attended by representatives of the Admiralty and of the United States Consular service. Of the passengers 179 were Americans, including women and children, and the fact that the attack was made in violation of all accepted international law, produced a feeling of widespread horror and indignation in the United States, and led to representations being made to the German government as discussed under **UNITED STATES, Foreign Policy.** Aside from the serious questions of international relations thus produced, the opinion of the world in general condemned the ruthless slaughter of women, children, and babies, without any corresponding military or commercial advantage. In addition there was widespread regret for the loss of life, especially as among the 114 Americans perishing were included men prominent in various fields of art, letters, and industry—Dr. F. S. Pearson, the head of the Pearson Engineering Corporation, and a leader in hydroelectric development; Albert L. Hopkins, president of the Newport News Shipbuilding Company; Lindon Bates, Jr., consulting engineer and author of technical books; Charles Frohman, theatrical manager; Charles Klein, playwright; Alfred G. Vanderbilt, the horseman and capitalist; Elbert Hubbard, author and lecturer, and his wife; Herbert S. Stone, editor and publisher of *The House Beautiful*; and Justus Miles Forman, novelist and playwright.

The *Lusitania* was probably the fastest of the transatlantic liners, maintaining often a mean speed of 26 knots. Her length over all was 785 feet; between perpendicular, 760 feet; molded breadth, 88 feet; molded depth, 60 feet, 4½ inches; gross tonnage, about 32,500 tons; and, when loaded to 33 feet, 6 inches, her displacement, she was about 38,000 tons. The hull was divided into 11 main water-tight compartments, separated from each other by transverse bulkheads, while there were longitudinal bulkheads on each side of the ship, a considerable distance from the outer skin, with coal bunkers in the intervening space. The vessel as regards its framing, deck, beams, and plating, was of the strongest construction. That the destruction

wrought by the explosion of the torpedo war head did as much damage as it did was a striking tribute to the T. N. T. explosive with which it probably was filled. See GREAT BRITAIN; NAVAL PROGRESS, *Naval Operations in 1915*; SUBMARINES; UNITED STATES AND THE WAR; and WAR OF THE NATIONS.

LUTHERANS. The Lutheran Church is the third largest Protestant denomination in the United States, where it had, in 1915, 2,434,184 communicants, 15,269 churches, and 9688 ministers. In Canada there were 229,864 communicants, 133 ministers, and about the same number of churches. In Canada the Lutheran Church conducts services in 13 different languages. The value of Lutheran church property in the United States and Canada in 1915 was over \$100,000,000. No form of church government is held to be essential, and the services and organization are carried on under Congregational, Presbyterian, and Episcopal forms. There are four general church bodies: the General Council, founded 1867; General Synod, founded 1820; Synodical Conference, founded 1872; United Synod South, founded 1886; United Norwegian; besides a number of independent synods.

GENERAL COUNCIL. The General Council in the United States in 1915 had 470,771 communicants, 2419 churches, and 1640 ministers.

GENERAL SYNOD. There were, in 1915, 356,072 communicants, 1830 churches, and 1426 ministers.

UNITED SYNOD SOUTH. There were, in 1915, 53,705 communicants, 490 churches, and 271 ministers.

SYNODICAL CONFERENCE. There were, in 1915, 821,386 communicants, 3796 churches, and 3132 ministers.

UNITED NORWEGIAN. There were 171,657 communicants in 1915, 1630 churches, and 674 ministers.

INDEPENDENT SYNODS. These had 560,593 communicants in 1915, 5104 churches, and 2545 ministers.

For 1915 the Lutherans report a loss of nearly 11,000 members, much of which may be explained, perhaps, by faulty returns. The foreign missionary work of the General Synod in 1915 showed much progress, and the gifts from all sources at home for the biennium were \$234,505, being 49 cents for each communicant, the highest average yet reached. The work in India also showed remarkable growth, preaching being carried on in 876 villages. There is a baptized membership in India of 49,604, and a communicant membership of 17,209. The home mission work in 1915 was the most successful in its history. The educational work was also highly prosperous. Six of the larger colleges and seminaries are in a flourishing condition. There was an increase of nearly 20 per cent in gross receipts, and of 10 per cent in receipts from apportionments.

The General Council during 1915 inaugurated a vigorous financial campaign in behalf of the educational institutions under its control. The war interfered greatly with the foreign missionary work. This, with the other Lutheran denominations, is planning for 1917 an elaborate celebration of the quadricentennial of the Reformation. The United Synod South showed steady progress in its missionary and educational work, with an increase of about 900 in membership.

The United Norwegian Lutheran Church celebrated its 25th anniversary in Minneapolis, Minn., on June 9th-17th. There was a large attendance. Twenty-four churches were dedicated during 1915, and 26 candidates for the ministry were ordained.

LUXEMBURG. A European grand duchy, bounded by Belgium, France, and Germany. Area, 2586 square kilometers (988 square miles); population, Dec. 1, 1910, 259,891. Luxembourg, the capital, had 20,848 inhabitants. Roman Catholics numbered 250,543. The grand duchy belongs to the German customs union. There were 325 miles of railway in 1913; 439 miles of telegraph line; post offices, 133. Iron production in 1911, 1,728,973 metric tons; in 1912, 2,252,229 tons. The area under principal crops in hectares and the yield in metric quintals for two years are shown in the table below.

	Hectares		Quintals	
	1913-14	1914-15	1913-14	1914-15
Wheat	10,659	11,700	142,966	140,400
Rye	10,483	10,840	142,578	130,080
Barley	1,497	1,400	23,527	14,500
Oats	31,219	30,000	549,266	308,500
Vines	1,518		48,018	
Potatoes	14,950	15,000	1,439,148	1,875,000

The budget as voted April 6, 1912, estimated the revenue at 18,696,137 francs; the expenditure at 20,629,710; 1913, 18,101,733 and 20,484,564; 1914, 22,017,337 and 23,440,531. The amount paid to Luxembourg by Germany on account of the German invasion is estimated at \$256,000. The debt amounts to 12,000,000 francs; annuities, 493,150. The floating debt, for public works and railway construction, is limited to 19,335,774 francs. The reigning house of Nassau became extinct in the male line with the death of the grand duke, William, Feb. 25, 1912. He was succeeded by his daughter, Marie-Adelaide (born June 14, 1894), who attained her majority and was formally enthroned June 14, 1912. Her sister, Princess Charlotte (born Jan. 23, 1896), is heiress presumptive.

MAAERTENS, MAARTEN. A British-Dutch novelist, whose real name was Joost Marius Willem van der Poorten-Schwartz. He was born at Amsterdam, Holland, on Aug. 15, 1858, and died on Aug. 4, 1915. He was brought up in England; attended the Königliche Gymnasium at Bonn, Germany; and studied law at the University of Utrecht, where he received the doctor's degree in 1883, and where he was docent in law in 1883-84. Thereafter he spent most of his time on the Riviera, in Paris, and at his residence, Zonheuvel Castle, near Doorn, Holland. In 1907 he visited the United States. Engaging in literary work, he wrote exclusively in English, and his writings include the following: *The Black-Box Murder* (1890); *The Sin of Joost Avelingh* (1890); *An Old Maid's Love* (1891); *A Question of Taste* (1891); *God's Fool* (1892); his best known novel, *The Greater Glory* (1894); *My Lady Nobody* (1895); *Her Memory* (1898); *Some Women I Have Known* (1899); *My Poor Relations* (1903); *Dorothea* (1904); *The Jailbird*, a one-act play (produced at Wyndham's Theatre, London, 1904); *The Healers* (1906); *The Woman's Victory* (1906); *The New Religion* (1907); *Brothers All* (1909); *The Price of Lis Doris* (1909); *Harmen Pols, Peasant* (1910); *Eve* (1912).

MACAO. A city on the Island of Macao, at

the mouth of the Canton River, China. The island, with the adjacent islets, Colhane and Taipa, is a Portuguese dependency, having an area of 4 square miles. The total population at the census of Dec. 31, 1910, was 74,866, of whom 60,057 were Chinese; whites numbered 3919, of whom 3780 were Portuguese. The trade, which is mostly transit, is carried on principally by the Chinese. Estimated revenue and expenditure (1913-14), 1,096,305 and 818,275 escudos, respectively.

M'CALVAY, AARON VANCE. American jurist, died July 9, 1915. He was born in Michigan in 1847, and graduated from the University of Michigan in 1868. After admission to the bar he practiced from 1871 to 1905 at Manaster, Mich. He was non-resident professor of law from 1898-1903 at the University of Michigan. From 1878-79 and from 1901-05 he was judge of the 19th judicial circuit of Michigan. He was elected Justice of the Supreme Court of the State in 1905, and was reelected in 1907.

McCLAIN, EMLIN. American jurist, died May 25, 1915. He was born in Salem, Ohio, in 1851, and graduated from the State University of Iowa in 1872. He studied law, and engaged in practice in Des Moines, where he remained until 1881. In that year he was appointed professor of law at the State University of Iowa. He was made vice-chancellor of the law department in 1887, and chancellor in 1890. In 1900 he was appointed a judge of the Supreme Court of Iowa, serving until 1912. In 1906 and again in 1912 he was chief justice. In 1913, until his death, he was professor of law in Leland Stanford University. He was a member of many important commissions on law revisions and legislations. He was the author of *McClain's Annotated Statutes of Iowa* (1880); *Outlines of Criminal Law and Procedure* (1884); and *Constitutional Law in the United States* (1905). He also contributed articles on law subjects to newspapers and law magazines.

MCCOLLOM, JOHN HILDBRETH. American physician and educator, died June 14, 1915. He was born in Pittston, Me., in 1843, and was educated at Phillips Academy, Andover. He studied medicine in the Harvard Medical School in 1859 and from 1871 until his death practiced in Boston. From 1862-65 he served as hospital steward in the 30th regiment of Massachusetts volunteers. He was city physician of Boston from 1891-95, and was resident physician of the South Department of Infectious Diseases at the Boston City Hospital from 1895 until his death. From 1903-08 he was assistant professor of contagious diseases at the Harvard Medical School, and in 1908 he became full professor. At the time of his death he was professor emeritus. He was the author of numerous contributions to leading medical journals.

MACCORD, CHARLES WILLIAM. American draftsman, died April 14, 1915. He was born in northeast Dutchess County, N. Y., in 1836, and graduated from Princeton University in 1854. From 1859-68 he was chief draftsman to Capt. John Ericsson. He drafted the plans for the original *Monitor* which fought against the *Merrimac* in Hampton Roads. From 1871-96 he was professor of mechanical drawing and designing at the Stevens Institute of Technology. In the latter year he became professor emeritus. He was the author of: *Mechanical Drawing, Progressive Exercises, and Practical Hints* (1888);

Elements of Descriptive Geometry (1895); *Velocity Diagrams* (1901). He also published various monographs on mechanism and applied kinematics.

McCORMICK, ALEXANDER HUGH. American rear admiral, retired, died Aug. 21, 1915. He was born in the District of Columbia, in 1842, and was appointed to the United States Naval Academy in 1859. He resigned in 1869, but was reinstated in the same year. He served throughout the Civil War, and took part in many important actions. In 1876 he was appointed commander and in 1892 captain. He became rear admiral in 1899. He was commander on the battleship *Oregon*, under Captain Clark, during the Spanish-American War.

McCULLOUGH, JOHN GRIFFITH. Former Governor of Vermont, died May 29, 1915. He was born in Newark, Del., in 1835. In 1859 he graduated from the Law School of the University of Pennsylvania and went to California on account of his health. He was admitted to the bar in that State, and entered the campaign to hold California in the Union during the Civil War. In 1861 he was elected to the State Legislature, and in the following year to the Senate. He served as attorney-general of California, and on the completion of his term settled in San Francisco. In 1873 he moved to North Bennington, Vt., and became interested in banking and railroads. For eight years he was vice-president, and for six years president, of the Panama Railroad Company. He was appointed receiver for the Erie Railroad after the panic of 1893. He was connected also with several other important railways. He was active in the politics of Vermont, and was elected Governor in 1892. He was a delegate to the National Conventions which nominated Garfield, Harrison, and McKinley.

MACDONALD, SIR CLAUDE MAXWELL. English soldier and diplomat, died Sept. 10, 1915. He was born in 1852, and was educated at Up-ingham School, and at the Royal Military College in Sandhurst. He became an officer in the Highland Light Infantry, and saw active service for the first time in the Egyptian expedition of 1882. In the following year he was appointed military attaché to the British Agency in Cairo. He took part in operations in the Eastern Sudan in 1884, and was wounded at the battle of Tamai. In 1887 he was made acting-agent and consul-general at Zanzibar, and in the following year was appointed commissioner on the west coast of Africa. Here with a small staff he built up a remarkably efficient system of government, in a territory which, when he assumed control, was almost an unknown land. When he left in 1895 he had established the foundation of a permanent civilization. The great administrative ability which he had shown won for him the ambassadorship to China, which became vacant in 1895. His administration of this office was remarkably efficient. Among his accomplishments were the opening of the West River to foreign trade, the settlement of the likin question at Canton, the lease of Wei-hai-wei, and various railway and mining concessions. During the Boxer rising in 1900 it was due largely to his forethought that when the foreign legations were besieged the British were able to shelter so large a number of refugees, and to offer such heroic resistance. In 1900 he was transferred to Tokyo as minister, and five years later became

the first British ambassador to Japan. After serving in that country for 12 years he retired in December, 1912. During his term of office there was concluded the Anglo-Japanese agreement in August, 1905, by which the interests of the two powers in the Far East are regulated.

MCGILL UNIVERSITY. An institution for higher education, founded in 1829 in Montreal, Canada. The total enrollment in the autumn of 1915 was 1540. The faculty numbered 235. Several members of the faculty resigned to join the troops sent to the war in Europe. Sir William C. MacDonald gave for the support of the work of MacDonald's College \$43,922. There was received from the estate of Lord Strathcona for the Royal Victoria College \$42,000. Other bequests amounted to about \$8000. The productive funds in 1915 were about \$8,250,000, and the income was about \$800,000. The library contained about 150,000 volumes.

MACHINE GUNS. See MILITARY PROGRESS.

MACKAYE, PERCY. See LITERATURE, ENGLISH AND AMERICAN, *Poetry*.

McKELWAY, ST. CLAIR. American editor, died July 16, 1915. He was born in Columbia, Mo., in 1845. His family removed to New Jersey in 1853. He was educated by private tutors. After studying law he was admitted to the New York bar in 1866, but never practiced. He was attracted by newspaper work, and for a time was a correspondent for the New York *Tribune*. For several years he wrote for this and other papers. After admission to the bar he joined the staff of the New York *World* and for four years was Washington correspondent and associate editor of this paper. In 1883 he became associate editor of the Brooklyn *Eagle*, and after several years of service joined the staff of the Albany *Argus*, of which he was the editor until 1885. In the latter year he returned to Brooklyn as editor of the *Eagle*. Previous to this time he made his mark throughout the State as a writer and lecturer, and received the degree of M.A. from Colgate University in 1883. After his editorship of the *Eagle*, he became known as a speaker and writer on educational, historical, and civic subjects, and proofs of his editorials were sent broadcast throughout the United States and were widely copied. In 1883 he was appointed a member of the Board of Regents of New York, and became vice-chancellor in 1900; on the death of Whitelaw Reid he was appointed chancellor. Mr. McKelway was a warm friend and supporter of President Cleveland. He was a director of the American Social Science Association and a member of the National Institute of Arts and Letters. He received degrees from Syracuse University, Union College, St. Lawrence University, and the University of Missouri.

MACKENSEN, AUGUST VON (1849—). A German field marshal, born in Hausleipnitz, Saxony. He entered the army in 1869 and became lieutenant of the reserve during the Franco-Prussian War (1870-71). In 1873 he became a lieutenant in the regular army; in 1876, adjutant of the first cavalry brigade; and in 1878 a lieutenant-colonel. In 1882 he was appointed to the general staff without having attended the military academy. In 1894 he was lieutenant-colonel and commander of the Life Hussars Regiment, and in 1895 was made aide-de-camp to the Kaiser. In 1901 he became commander of the newly organized Life Hussars Brigade. From 1903-08 he was commander of the 36th division,

and after the latter year was commander of the 17th army corps. During the great war which began in 1914, he was appointed chief of staff under General von Hindenburg (q.v.) in the Russian campaign, and in 1915 he was given the chief command of the great Teutonic drive into the Balkan Peninsula. He was also appointed to the rank of field marshal. (See WAR OF THE NATIONS.) His writings include *Schwarze Husaren*, *Geschichte des Leibhusarenregiments*, and *Leibhusarenregiments Kaiserin Nr. 2* (2 vols., Berlin, 1892).

MACKENZIE, MORRIS ROBINSON SLIDELL. American rear admiral, retired, died Jan. 10, 1915. He was born in New York City, and graduated from the United States Naval Academy in 1866. In 1870 he became lieutenant, and in 1884 lieutenant-commander. He was promoted to be captain in 1890, and in 1906 on his retirement became rear admiral. He served on various stations, and for two years commanded the *Prairie*. He also commanded the battleship *New York*, and was for a time in charge of the Portsmouth Navy Yard. Prior to his retirement he was inspector in charge of the third lighthouse district.

MCMILLAN EXPEDITION. See POLAR RESEARCH.

MCPHERSON, SMITH. An American jurist, died Jan. 18, 1915. He was born near Mooresville, Morgan Co., Ind., in 1846, and received his education in public schools. He studied law and was admitted to the bar in 1870. From 1874-80 he was district attorney of the third judicial district of Iowa, and was attorney-general of the State from 1881-85. In 1899 he was elected to the 56th Congress. He resigned his seat in 1900 to become judge of the Southern District of Iowa. His decisions in several railroad rate cases brought him to public attention. In 1905 he restrained officers of the State of Missouri from enforcing the maximum freight rate law, and in 1909 granted a permanent injunction preventing the State authorities from enforcing the two-cent passenger rate law. Judge McPherson was one of the Republican leaders of the State of Iowa.

MADAGASCAR. A great island in the Indian Ocean off the east coast of Africa, composing, with its dependencies, a French colony. Antananarivo (Tananarive) is the capital, with 72,000 inhabitants. The area of Madagascar, with several small dependent islands, is stated at 585,533 square kilometers (226,074 square miles). The population as calculated Jan. 1, 1914, was 3,253,581—14,918 Europeans, 12,905 Asiatics and Africans, 3,225,758 aborigines. Including Mayotte and the Comoro Islands, the population was 3,351,481. The Hova inhabit that portion of the central plateau now known as Imerina, anciently called Ankova—the country of the Hova. Fianarantsoa has about 7000 inhabitants; Tamatave, 7026; Majunga, 4600.

PRODUCTION, COMMERCE, ETC. Agriculture and cattle-raising are the chief industries, and rice is the principal crop. The forests contain valuable timber. The mines yield gold, silver, iron, copper, lead, and zinc. Imports and exports for three years are shown in the following table in francs:

	1911	1912	1913
Imports	44,763,892	50,034,848	46,747,456
Exports	47,535,361	59,844,294	56,054,377

The export of raw hides in 1912 was valued at 10,752,572 francs; raw gold, 5,989,175; rubber, 5,181,431; vanilla, 3,941,521; raffia, 3,787,936; legumes, 2,807,575; wax, 1,696,760; cattle, 1,008,685; ebony, 425,000, etc. There were entered at the ports in the 1913 trade 233 vessels, of 329,750 tons. The debt stood, Jan. 1, 1913, at 97,484,118 francs. Railways (1914), 369 kilometers. A governor-general administers the colony.

MAES, CAMILLUS. American Roman Catholic bishop, died May, 1915. He was born in Courtrai, Belgium, in 1846, and in 1864 graduated from the College of Courtrai. He studied at the American College at Louvain, graduating in 1864, and in the same year was ordained a priest. In 1869 he removed to the United States. From that year until 1880 he was pastor in Maryland. He was appointed secretary of the diocese of Detroit in 1880, holding that post for five years, when he was consecrated bishop at Covington, Ky. He was a member of the board of directors of the Catholic University of America, and of the Catholic Extension Society of America. He was also prominent in the Eucharistic Conferences, and was the founder of the Eucharistic League. He was the author of the *Life of Father Nerinsk* (1880).

MAETERLINCK'S Interior, PERFORMANCE OF IN ENGLISH. See **DRAMA, AMERICAN AND ENGLISH.**

MAGNETISM, TERRESTRIAL. See **EXPLORATION, Oceanic.**

MAIL. See **UNITED STATES, Post Office.**

MAINE. POPULATION. The estimated population of the State on July 31, 1915, was 767,638. The population in 1910 was 742,371.

AGRICULTURE. The acreage, production, and value of the principal crops, estimated by the United States Department of Agriculture in 1914-15, were as follows:

	Acreage	Prod. Bu.	Value
Corn 1915	16,000	656,000	\$558,000
..... 1914	16,000	786,000	648,000
Wheat 1915	4,000	112,000	125,000
..... 1914	3,000	81,000	88,000
Oats 1915	152,000	6,080,000	3,736,000
..... 1914	141,000	5,781,000	3,295,000
Barley 1915	5,000	132,000	99,000
..... 1914	5,000	150,000	122,000
Potatoes ... 1915	142,000	22,010,000	15,407,000
..... 1914	130,000	33,800,000	11,154,000
Hay 1915	1,215,000	1,397,000	20,815,000
..... 1914	1,230,000	1,414,000	18,523,000
Buckwheat . 1915	13,000	388,000	287,000
..... 1914	12,000	348,000	209,000

a Tons.

LIVE STOCK. The United States Department of Agriculture estimated that on Jan. 1, 1916, and Jan. 1, 1915, horses numbered 112,000 and 113,000, valued at \$15,904,000 and \$16,498,000; milch cows numbered 159,000 and 157,000, valued at \$7,950,000 and \$8,478,000; other cattle numbered 104,000 and 101,000, valued at \$2,558,000 and \$2,636,000; sheep numbered 162,000 and 165,000, valued at \$778,000 and \$742,000; swine numbered 102,000 and 95,000, valued at \$1,224,000 and \$1,492,000. The production of wool in 1915 and 1914 was 906,000 and 932,000 pounds respectively.

MINERAL PRODUCTION. The stone production, which consists almost entirely of granite, was valued at \$1,723,032 in 1914. Clay products, exclusive of pottery, ranked second in value, which amounted to \$914,808. The total value

of all mineral products in 1914 was \$3,975,890, compared with \$4,429,584 in 1913.

TRANSPORTATION. The total railway mileage in the State in 1914 was 2300. There was no increase of this during 1915. Railways having the longest mileage are the Maine Central, 995; Bangor and Aroostook, 630; Canadian Pacific, 177; and Boston and Maine, 139.

EDUCATION. The average enrollment in the elementary schools in 1914 was 133,006. The average daily attendance in these schools was 101,996. The Legislature of 1915 enacted several important measures relating to education. The number of weeks that towns are required to maintain schools annually was raised from 26 to 30. Provision was also made for traveling libraries in high schools where towns have no libraries.

FINANCE. The report of the State treasurer for the fiscal year ending Dec. 31, 1914, showed the total receipts were \$6,353,307, and a balance at the beginning of the year of \$649,303. The total expenditures amounted to \$6,224,625, leaving a balance at the end of the year of \$777,985. The bonded debt of the State is about \$560,000.

CHARITIES AND CORRECTIONS. The charitable institutions of the State are the State Hospitals at Augusta and Bangor, the Maine School for Feeble-minded, and the Bath Military and Naval Asylum at Bath. The correctional institutions include the Maine Industrial School for Girls at Hallowell, the State School for Boys at South Portland, and the Maine State Prison at Thomaston. The total expenditure for the support of these institutions is about \$1,000,000 annually.

POLITICS AND GOVERNMENT. The Legislature was in session in 1915. It passed a law providing a 54-hour week for both women and boys under 16 working in mills, factories, and laundries. The workmen's compensation law was amended by a provision that the employer should not pay more than \$10 a week in case of total disability, with a maximum of \$3000. Heirs in case of death received the same amount, and the scale of payments for partly disabled ranged from \$4 to \$10 a week. A woman suffrage measure failed to pass the House on March 23rd by a very close margin.

STATE GOVERNMENT. Governor, Oakley C. Curtis; Secretary of State, John E. Bunker; State Auditor, J. Edward Sullivan; State Treasurer, Elmer E. Newbert; Adjutant-General, George McL. Presson; Attorney-General, William R. Pattangall; Superintendent of Schools, Payson Smith; Insurance Commissioner, Erastus J. Carter; Bank Commissioner, Irving E. Vernon; State Librarian, Henry E. Dunnack; Commissioner of Labor, Roscoe A. Eddy; Commissioner of Agriculture, William T. Guptill.

JUDICIARY. Supreme Court: Chief Justice, Albert R. Savage; Associate Justices, Albert M. Spear, Leslie C. Cornish, Arno W. King, George E. Bird, George F. Haley, George M. Hanson, Warren C. Philbrook.

STATE LEGISLATURE:

	Senate	House	Joint Ballot
Democrats	14	78	92
Republicans	17	69	86
Progressives	..	4	4
Majority	3 R	5 D	..

MAINE, UNIVERSITY OF. A State institution for higher education, founded at Orono, Me., in

1865. It includes colleges of agriculture, law, technology, arts and sciences, and the agricultural experiment station. The total enrollment in all these departments in the autumn of 1915 was 1265. The faculty numbered 154. No notable changes in the membership of the faculty were made during the year, and no noteworthy benefactions were received. The income for 1915 amounted to \$291,166. The institution is supported almost entirely by legislative appropriations. The library in 1915 contained 56,000 volumes.

MALACCA. One of the Straits Settlements (q.v.).

MALARIA. The most notable contributions of the year to this subject were made by Bass and Barlow. The former, in treating violent types of malarial infection, discovered that small doses of bichloride of mercury, well diluted and given by intravenous injection, had a curative effect far superior to that of quinine, which in these cases appeared to be impotent. Barlow cites the case of a native who had suffered nine days from a violent tertian infection, with but one brood of plasmodia. An intravenous injection of less than one-fourth grain of mercuric chloride controlled the paroxysm immediately and the temperature subsided. This drug apparently has the effect of arresting and destroying the plasmodia in the blood; for six weeks later a series of blood specimens taken from the patient showed no parasites and there was no further return of symptoms. The effect of mercury on the organism was to inhibit ameboid motion, whereas after a dose of quinine in a similar case the ameboid motion was more active. Other phenomena noted were that under mercury growth was checked, only a few schizonts proceeded to full development, and penetration of the red cells had stopped; whereas quinine has a precisely opposite effect.

The transmission of malaria is at the present day believed to be carried on by a single variety of the *Anophelinæ*, but over 100 species of these mosquitoes have been identified, and of these less than a third have been proved to transmit malaria. The remaining species have not been studied or have not shown evidence of the ability to carry the plasmodium. Carter gives a concrete illustration of the economic importance of knowing the potency of each species of *Anophelinæ* to transmit malaria by showing that, in the Canal Zone, between \$100,000 and \$250,000 was saved by the knowledge that the *Anopheles malefactor*, which breeds in collections of water in hollow stumps, was not a carrier. Walker and Barker, of the Bureau of Science, in the Philippines, assert that of the 17 recognized species of *Anophelinæ* on the islands, only 6 are at present known to be transmitters of malaria. They studied five species, and dissected 1287 specimens to see if oöcysts were present. Four of the five species proved to be capable of infection. *Anopheles febrifer* was the most susceptible to infection, and is probably the most important mosquito concerned in the carrying of malaria in the Philippines. *Anopheles barbirostris*, *A. rosi*, and *A. maculatus* were less susceptible. The factors which determine the importance of a particular species of mosquito as a carrier of malaria in any country are its susceptibility to malarial infection, its geographic distribution, its avidity for human blood, its domesticity, and its prevalence. Sanitarians are

most concerned in its susceptibility, but its blood-sucking propensities and its domesticity are qualities of no slight moment. See INSECTS, PROPAGATION OF DISEASE BY.

MALAY STATES. See FEDERATED MALAY STATES; JOHORE; KEDAH; KELANTAN; NEGBI SEMBILAN; PAHANG; PERAK; SELANGOR; TRENGGANU.

MALONE, WALTER. American jurist, and author, died May 18, 1915. He was born in De Soto Co., Mo., in 1866, and graduated from the University of Michigan in 1887. He studied law and after his admission to the bar practiced law at Memphis, Tenn., from 1891-97. For the three years following the latter date he was engaged in literary work in New York City. Then he resumed law practice in Memphis. In 1905 he was appointed judge of the second circuit court of Tennessee. He was the author of: *Claribel and Other Poems* (1882); *The Outcast and Other Poems* (1885); *The Songs of Dusk and Dawn* (1894); *The Coming of the King*, short stories (1897); *The Songs of North and South* (1900); *Poems* (1904); and *Songs of East and West* (1906).

MALTA. An island (91½ square miles) in the Mediterranean Sea, which, with the islands of Gozo (25½ square miles), Comino (1 square mile), and Filfla and Cominotto (mere islets), forms a British crown colony. Total civil population, 1911 census, 213,395; estimate March 31, 1914, 219,311. Valletta, the capital, had, April 2, 1911, 44,143 inhabitants, including suburbs (Floriana, Sliema, and St. Julien's); the Three Cities (Senglea, Cospicua, and Vittoriosa), 26,551; Citta Vecchia (the old capital), 8896; Victoria (formerly Rabat), 5655. The natives are of Punic origin, and their speech is said to be derived from the Carthaginian and Arabic languages; about 70 per cent of its vocabulary is Semitic, but its grammatical structure is derived from the Latin. Valletta is a coaling station and the centre of a large transit trade. There are 7¾ miles of railway. Imports and exports (1913-14), £2,510,934 and £1,053,854, respectively. Total weight of goods transhipped (1913-14), 12,839 tons. Revenue (1913-14), £423,108; expenditure, £402,521. Tonnage entered and cleared, 11,097,612 (British, 5,691,394).

MAMMALS. See ZOÖLOGY.

MANCHURIA. A dependency of China. It lies east of Mongolia and the Province of Chihli and between Korea and the Amur River, which separates it on the north from Siberia. The country consists of three provinces—Heilungkiang, in the north, Kirin, and Shengking, in the south; their total estimated area is 362,483 square miles, or slightly larger than the combined area of Mississippi, Louisiana, and Texas, which is 361,267 square miles. Population estimates vary widely. The figure derived from the 1910 enumeration of households is 12,742,360, but this does not include children under six years of age; including such children, the estimate is 13,104,000. Estimated population of Heilungkiang (with an area of 202,703 square miles), 1,607,000; Kirin (105,019 square miles), 5,501,000; Shengking (54,761 square miles), 5,996,000. The Manchu population has practically disappeared, and the country has been colonized from China proper. A considerable Chinese immigration continues, attracted by the exceptionally fertile soil and the very profitable soya

bean culture. Among the principal towns are: Mukden, the administrative headquarters and also the capital of Shengking, with an estimated population of 158,000; Kirin, capital of Kirin province, whose population has been estimated as high as 100,000; Tsitsihar, capital of Heilungkiang, with perhaps 60,000 inhabitants; Antung, 160,000; Kwangchengtze (Changchun), about 80,000; Harbin, 68,000; Newchwang (Yingtze), at the mouth of the Liao River, about 75,000; Newchwang City, 30 miles up the Liao, about 50,000; Liaoyang, 40,000; Tiehling, 28,500; Fenghwangcheng, 25,000; Sinminfu, 20,000; Fakumen, 19,500.

Important products are the soya bean, millet, corn, Kafir corn, wheat, and tobacco. There are valuable mineral deposits, and coal and iron are worked. Imports and exports through the three chief ports of Dairen, Newchwang, and Antung were valued at £5,947,337 and £6,477,460, respectively, in 1912; in 1913, £6,477,460 and £6,752,049. Both Russian and Japanese influence is exerted to develop the industrial and commercial interests of the country.

The total length of railway at the beginning of 1912 has been reported at 2182 miles. In the southern part of Shengking is the Japanese leasehold of Kwantung (q.v.), containing Ryojun (Port Arthur) and Dalny. From Kwantung the Japanese sphere of influence extends northward to Kwangchengtze; southward to this point the Russian sphere of influence extends, and at Kwangchengtze the Russian railway running south from Harbin connects with the Japanese railway running north from Ryojun, Dairen, and Mukden. Mukden is connected with China proper by a branch of the Chinese Imperial Railways, and with Antung by a Japanese line, which connects with the Korean railways. The Russian line to Vladivostok traverses Heilungkiang and Kirin provinces, passing through Harbin.

MANATT, JAMES IRVING. American scholar and educator, died Feb. 14, 1915. He was born in Millersburg, Ohio, in 1845. He served as a private in the Civil War, and in 1869 graduated from Grinnell College. From 1874-76 he was professor of Greek at Denison University. After taking postgraduate studies in Germany he became chancellor of the University of Nebraska in 1884, holding this post until 1899, when he was appointed United States consul at Athens. From 1893 until his death he was professor of Greek literature and history at Brown University. He was a member of many learned societies, and was the author of *The Mycenaean Age* (with Dr. Tsountas, 1897) and *Aegean Days* (1913). He also edited several Greek texts, and contributed to reviews and magazines.

MANITOBA. One of the Northwest Provinces of Canada. Area, 251,832 square miles; population (1911), 461,630. This area includes that portion of the Northwest Territories annexed to Manitoba in 1912. Previously the area of the Province was 73,732 square miles, with a population (1911) of 455,614. The Indian population in 1915 was about 10,800, or somewhat more than one-tenth that of the Dominion. The capital is Winnipeg, with (1911) 136,035 inhabitants. The Province is administered by a Lieutenant-Governor, appointed by the Governor-General of the Dominion, and acting through a responsible council. The legislative assembly consists of one house of 41 members elected for four years. The Lieutenant-Governor in 1915

was Sir Douglas Colin Cameron, appointed Aug. 1, 1911. The Premier in 1915 was T. C. Norris, who was also commissioner of railways and commissioner of provincial lands. See also CANADA.

MANITOBA CORRUPTION CASE. Premier Sir R. P. Roblin and other Conservative officials of the Manitoba Provincial government resigned on May 12th after charges of corruption had been brought against them. T. C. Norris, leader of the Liberal Opposition, immediately began the work of organizing a new government. Late in June in the investigation proceedings on the charge of corruption in office, the names of Robert Rogers, Canadian minister of public works, and Sir William Mackenzie, head of the Canadian Northern Railway, were implicated in the case. It was charged that the Roblin government had been aware of overpayments to the contractors engaged in constructing the new Parliament buildings in Winnipeg. In the elections in August the Conservative Party, which had been in power for 15 years, was defeated decisively, and the Liberals under T. C. Norris were returned victorious. The Royal Commission, composed of three Canadian judges, sat in August to determine the guilt or innocence of the Roblin government. At the close of the preliminary hearing on October 8th, Sir Rodman Roblin and three other cabinet ministers were committed for trial on the charge of conspiracy to defraud the government in connection with the erection of the new Parliament buildings at Winnipeg.

MANNEY, HENRY NEUMAN. American rear admiral retired, died Oct. 25, 1915. He was born in La Porte, Ind., in 1844, and graduated from the United States Naval Academy in 1866. He had previously served in the Civil War. He was made master in 1869, lieutenant-commander in 1886, commander in 1895, captain in 1901, and rear admiral in 1906. In the latter year he retired. He commanded many ships and served in many important capacities. He was recognized as one of the best navigators in the country. One of the best known of his performances was the taking of the battleship *Massachusetts* through Hell Gate in the East River, New York. In piloting the warship through this dangerous passage, he proved its capacity for the passage of the largest battleships. Admiral Manney introduced wireless telegraphy into the navy. When he retired in 1909 he was chief of the Bureau of Equipment. In 1906 he was a delegate to the International Conference on Wireless Telegraphy in Berlin.

MANUFACTURES. See UNITED STATES and other countries, under section entitled *Manufactures*.

MARINE DISASTERS. See SAFETY AT SEA; SHIPBUILDING; SHIPPING; and WAR OF THE NATIONS.

MARITIME PROVINCES. The Canadian provinces of New Brunswick, Nova Scotia, and Prince Edward Island. See the articles under these titles; see also CANADA.

MARKETS. See HORTICULTURE.

MARKET SYSTEMS. See AGRICULTURAL LEGISLATION.

MARS. See ASTRONOMY.

MARTIN, JAMES LOREN. American jurist, died Jan. 14, 1915. He was born at Landgrove, Vt., in 1846, and graduated from Marlow Academy in 1867. He studied law at the Albany

Law School, taking his degree in 1869; in the same year he was admitted to the bar. He began practice at Londonderry, and afterwards removed to Brattleboro. He was State attorney from 1874-76 and from 1874-82 was a member of the State House of Representatives. From 1878-82 he was speaker of the House. He was commissioner of State taxes at various times from 1888 to 1894, and in 1898. In 1906 he was appointed United States attorney for Vermont, and in the latter year was appointed United States district judge for the district of Vermont.

MARTINIQUE. A French colony; an island of the Lesser Antilles. Area, 987 square kilometers (381 square miles); population (1911), 185,385. Fort-de-France, the capital, has about 27,000 inhabitants. Imports in 1912 were valued at 21,520,000 francs (from France, 11,510,000); exports, 30,523,000 (to France, 28,574,000).

MARYLAND. POPULATION. The estimated population of the State on July 31, 1915, was 1,351,941. The population in 1910 was 1,295,346.

AGRICULTURE. The acreage, production, and value of the principal crops, estimated by the United States Department of Agriculture, in 1914-15 were as follows:

	Acreage	Prod. Bu.	Value
Corn 1915	710,000	24,850,000	\$15,158,000
..... 1914	663,000	24,531,000	16,681,000
Wheat 1915	638,000	10,272,000	10,786,000
..... 1914	612,000	13,158,000	13,947,000
Oats 1915	45,000	1,530,000	750,000
..... 1914	43,000	1,161,000	604,000
Rye 1915	24,000	396,000	348,000
..... 1914	25,000	425,000	366,000
Barley 1915	5,000	170,000	119,000
..... 1914	5,000	165,000	109,000
Potatoes ... 1915	44,000	4,268,000	2,646,000
..... 1914	44,000	3,432,000	2,059,000
Hay 1915	390,000	a 468,000	7,582,000
..... 1914	390,000	448,000	6,854,000
Tobacco ... 1915	22,000 b	16,280,000	1,384,000
..... 1914	22,000	17,600,000	1,408,000
Sweet			
Potatoes .. 1915	8,000	1,040,000	728,000
1914	8,000	1,000,000	700,000

a Tons. b Pounds.

LIVE STOCK. The United States Department of Agriculture estimated that on Jan. 1, 1916, and Jan. 1, 1915, horses numbered 169,000 and 167,000 valued at \$17,745,000 and \$18,871,000, mules numbered 25,000 and 25,000 valued at \$3,025,000 and \$3,450,000, milch cows numbered 181,000 and 177,000 valued at \$9,412,000 and \$9,558,000, other cattle numbered 125,000 and 121,000 valued at \$3,600,000 and \$3,570,000, sheep numbered 223,000 and 223,000 valued at \$1,204,000 and \$1,160,000, swine numbered 359,000 and 349,000 valued at \$3,052,000 and \$3,385,000. The production of wool in 1915 and 1914 was 755,000 and 749,000 pounds respectively.

MINERAL PRODUCTION. The coal mines of the State in 1914 produced 4,133,547 short tons, valued at \$5,234,796, as compared with 4,779,839, valued at \$5,027,046 in 1913. The annual production of coal in the State has been very constant for the last 19 years. There were, during the year, 18 fatal accidents. The chromite produced amounted to 29,755 short tons, from which were derived products valued at \$1,846,500. The total value of mineral products in 1914 was \$10,587,564, as compared with \$11,292,723 for 1913.

TRANSPORTATION. The total railway mileage

in the State on June 30, 1914, was 1401 miles of single track. The Baltimore and Ohio, 336 miles, has the longest mileage in the State; the Philadelphia, Baltimore, and Washington had 329; the Western Maryland, 272; and the Baltimore, Chesapeake, and Atlantic, 88.

EDUCATION. The latest statistics available for education in the State are for 1913. On July 1st, of that year, there were 2469 schools, of which 2358 were in counties, and 111 in Baltimore. The total number of pupils was 237,835. The average number in daily attendance was 155,007. The number of teachers was 5805. The total expenditures for the public schools in the State during the year was \$5,326,876. Of this, \$3,095,095 was expended for teachers' salaries. The total value of the school property was \$10,672,069.

FINANCE. The receipts for the fiscal year 1914, the latest figures available, were \$12,006,566. The disbursements aggregated \$12,999,561. There was a balance in the treasury on Sept. 30, 1914, of \$1,840,256. The bonded debt of the State on Sept. 30, 1914, amounted to \$19,685,880.

CHARITIES AND CORRECTIONS. The charities and corrections of the State are under the control of the Board of State Aid and Charities. State aid is given to a large number of reformatories, homes and asylums for children and adults, and hospitals. The correctional institutions include: St. Mary's Industrial School at Baltimore, the Industrial School for Girls at Melvale, House of Good Shepherd, colored, at Baltimore, Industrial School for Girls at Lochraven, House of Reform for Colored Boys at Cheltenham, and Maryland Industrial School for Girls at Baltimore. There are in the State 23 general hospitals, 7 hospitals for the insane, and 9 special hospitals. Convicts of the State are generally employed under contract, the majority being engaged in the manufacture of boots and shoes.

POLITICS AND GOVERNMENT. On November 2nd, Emerson C. Harrington, former State controller, was elected to succeed Governor Goldsborough. He defeated O. E. Weller, the Republican candidate by about 3500 votes. The election changed the representation of the Legislature to 17 Democrats and 10 Republicans in the Senate, and 55 Democrats and 47 Republicans in the House of Delegates. Four amendments to the constitution were ratified. They provided for the referendum, reclassification of property for taxation purposes, home rule for Baltimore City and the counties in matters of purely local legislation, and parole in criminal cases. On May 4th, Mayor James H. Preston, Democrat, was elected mayor of Baltimore by a large majority, defeating Charles Heintzeman.

STATE GOVERNMENT. Governor, Emerson C. Harrington, Dem.; Secretary of State, R. P. Graham, Rep.; Auditor, J. Enos Ray, Dem.; Comptroller, Hugh A. McMullen, Dem.; Treasurer, Murray Vandiver, Dem.; Adjutant-General, C. F. Macklin, Rep.; Attorney-General, Albert C. Ritchie, Dem.; Superintendent of Education, M. B. Stephens, Dem.; Commissioner of Insurance, W. Mason Shehan, Dem.

JUDICIARY. Court of Appeals: Chief Judge, Andrew H. Boyd; Associate Judges, N. Charles Burke, William H. Thomas, John R. Pattison, Hammond Urner, John P. Briscoe, Henry Stock-

bridge, and Albert Constable; Clerk, Caleb C. Magruder.

STATE LEGISLATURE:

	<i>Senate</i>	<i>House</i>	<i>Joint Ballot</i>
Democrats	17	55	72
Republicans	10	47	57
Democratic majority..	7	8	15

MARYLAND, UNIVERSITY OF. A State institution for higher education at Annapolis and Baltimore, founded in 1784. There were enrolled in all departments in the autumn of 1915, 1300 students. The instructors numbered 211. There were no noteworthy changes in the faculty during the year, and no notable benefactions were received. The university is maintained chiefly by legislative appropriations. The productive funds amount to about \$150,000, and the annual income to about \$250,000. In the library are about 25,000 volumes. The president is Thomas Fell, Ph.D., LL.D.

MASSACHUSETTS. POPULATION. According to the 1915 State census, the population was 3,693,310. The population in 1910 was 3,366,416.

AGRICULTURE. The acreage, production, and value of the principal crops, estimated by the United States Department of Agriculture, in 1914-15 were as follows:

	<i>Acreage</i>	<i>Prod. Bu.</i>	<i>Value</i>
Corn .....1915	48,000	2,804,000	\$1,848,000
.....1914	48,000	2,256,000	1,918,000
Oats .....1915	9,000	324,000	185,000
.....1914	9,000	333,000	186,000
Rye .....1915	3,000	60,000	61,000
.....1914	3,000	57,000	58,000
Potatoes ....1915	26,000	3,120,000	2,938,000
.....1914	27,000	4,185,000	2,971,000
Hay .....1915	470,000	a 705,000	15,510,000
.....1914	480,000	634,000	18,631,000
Tobacco ...1915	7,300	b 8,030,000	1,164,000
.....1914	6,600	11,550,000	2,044,000

a Tons. b Pounds.

LIVE STOCK. The United States Department of Agriculture estimated that on Jan. 1, 1916, and Jan. 1, 1915, horses numbered 63,000 and 64,000 valued at \$9,198,000 and \$9,920,000, milch cows numbered 155,000 and 157,000 valued at \$10,540,000 and \$10,362,000, other cattle numbered 85,000 and 83,000 valued at \$2,159,000 and \$2,083,000, sheep numbered 28,000 and 30,000, valued at \$154,000 and \$168,000, swine numbered 112,000 and 108,000 valued at \$1,478,000 and \$1,674,000. The production of wool in 1915 and 1914 was 131,000 and 128,000 pounds respectively.

MINERAL PRODUCTION. As in most of the New England States, stone is the leading mineral product. The value of this in 1914 was \$3,438,556, more than half of which was attributed to granite. The value of clay products in that year was \$1,681,557. In that year the total value of all mineral products amounted to \$6,292,833, as compared with \$7,044,529 in 1913.

TRANSPORTATION. The total railway mileage in the State in 1914 was 4937, of which 2125 was main track line. The principal roads and their mileage are: the Boston and Albany, 961; Boston and Maine, 1967; and the New York, New Haven, and Hartford, 1833. For the history of the litigation in connection with this road during 1915, see RAILWAYS. There was practically no railway construction in 1915.

EDUCATION. The latest statistics available for education in the State are for Sept. 1, 1913. The total number of children in the State on that date between the ages of 5 and 15 was 602,591. The average daily attendance in all schools was 486,869. The teachers numbered 15,604 women and 1863 men. The Legislature of 1915 passed a number of laws relating to education. Among these was established the Department of University Extension, and provision was made for correspondence courses of education.

FINANCE. According to the report of the treasurer and receiver-general for the year ending Dec. 1, 1914, the net receipts for the year amounted to \$18,063,298, and net payments to \$18,414,505, leaving an excess of payments over receipts of \$351,207. There was a balance on Dec. 1, 1914, of \$2,862,884. The total bonded indebtedness on Dec. 1, 1914, less sinking funds, was \$84,701,602.

CHARITIES AND CORRECTIONS. The charitable and correctional institutions include: the State Infirmary at Tewksbury, the State Farm at Bridgewater, the Norfolk State Hospital, the Lyman School for Boys at Westborough, the Industrial School for Boys at Shirley, the State Industrial School for Girls at Lancaster, the Massachusetts Hospital School at Canton, the North Reading State Sanatorium, the Rutland State Sanatorium, the Lakeville State Sanatorium, and the Westfield State Sanatorium. The inmates receiving care number about 20,000 each year, and the cost of maintenance is about \$1,500,000. The prisons, which include the State Prison in Boston, the Massachusetts Reformatory at Concord, Reformatory for Women at Sherborn, Prison Camp and Hospital at Rutland, State Farm at Bridgewater, are under the control of a Board of Prison Commissioners.

POLITICS AND GOVERNMENT. David I. Walsh, Democrat, was inaugurated as Governor for a second term on January 7th. In his inaugural address he laid special stress on the problem of employment, and urged a \$50,000 appropriation for land reformation for the unemployed. He also investigated the telegraph and telephone service, and urged an amendment for the woman suffrage, initiative and referendum.

On February 4th, a hearing was held before the committee on legal affairs of the Legislature, at which graduates and professors of Harvard University and the representative of the Socialist Party advocated the amendment of the so-called Red Flag Act, making it possible for any religious, educational, or charitable organization to carry its red flag in a parade. The bill prohibiting the carrying of such flags was originally passed to prevent any repetition of the strike scenes in Lawrence.

A measure providing for the submission of a woman suffrage amendment to the Constitution passed both houses of the Legislature in February. It had already been passed by the Legislature of 1914.

On November 2nd, Samuel W. McCall, Republican, was elected Governor by a plurality of 6376. With one exception the vote was the largest ever polled by a candidate for Governor in the State. He defeated Governor David I. Walsh, Democrat, and Nelson B. Clark, Progressive. Calvin Coolidge, Republican, was elected Lieutenant-Governor. At the same election, 40 Senators and 200 members of the House of Representatives were also elected. The Prohibition

party in this election polled more than 3 per cent of the total vote for Governor, and thus became a recognized political organization in the State. The Progressives failed to poll 3 per cent of the total vote, and thus are placed in the unofficial list with the Socialist and Socialist-Labor parties. The woman suffrage amendment, voted on at this election, was defeated by 133,087 votes. The total vote was—against, 235,702; for, 102,615. In addition to the suffrage amendment, a vote was taken upon the proposition to give the Legislature authority to impose a tax on incomes and to take over land in country districts for the purpose of establishing homesteads for those who may wish to escape from the more congested quarters of the city. The two latter amendments were carried by votes of nearly 3 to 1.

By a decree issued on July 14th, by the State Minimum Wage Commission, women employees of laundries must be paid not less than \$8 a week after Sept. 1, 1915. A minimum weekly wage of \$8.50 to women over 18 years of age in department and other retail stores was recommended in a report of the special board. See MINIMUM WAGE.

STATE OFFICERS. The State officers elected in 1915 are: Governor, Samuel W. McCall, Republican; Lieutenant-Governor, Calvin Coolidge, Republican; Secretary of State, Albert P. Langtry, Republican; Treasurer, Charles L. Burrill, Republican; Auditor, Alonzo B. Cook, Republican; Adjutant-General, Charles H. Cole, Democrat; Attorney-General, Henry C. Atwill, Republican; Secretary of the Board of Agriculture, Wilfrid Wheeler, Democrat; Commissioner of Insurance, Frank H. Hardison, Democrat; Commissioner of Education, David Snedden, Democrat.

JUDICIARY. Chief Justice, A. P. Rugg. Justices of the Supreme Court were: William K. Liptry, Henry Keen Brady, Charles Ambrose De Courcy, John Crawford Crosby, Edward Peter Pierce, John Bernard Carroll.

STATE LEGISLATURE:

	<i>Senate</i>	<i>House</i>	<i>Joint Ballot*</i>
Republicans	84	165	199
Democrats	6	78	79
Socialists	—	1	1
Republican majority	28	91	119

* One vacancy.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY. An institution for scientific education, founded in Boston in 1861. The total enrollment in all departments in the autumn of 1915 was 1900. The faculty numbered 125, and in addition there were 137 instructors and assistants. Noteworthy benefactions received during the year 1915 include \$600,000 from an anonymous giver; \$100,000 from the estate of E. S. Draper; and \$75,000 from the alumni. Construction of new buildings for the institute at Cambridge progressed during the year. The productive funds at the end of the fiscal year amounted to \$3,332,698, and the total income to \$721,703. The library contained about 100,000 volumes.

MASTERS, EDGAR LEE. See LITERATURE, ENGLISH AND AMERICAN, *Poetry*.

MAURITANIA. A French West African civil territory, governed from Saint-Louis (Sene-

gal) by a commission under the direction of the Governor-General of French West Africa. The chief towns are Port-Etienne, Boutillimit, Aleg, Moudjeria, Kaedi, Atar, Selibaby, Tidjikdja, etc. Excepting a few groups rendered semi-sedentary by the necessity of tending the palm plantations, the Moors, who constitute the larger part of the population, are nomads. They live in encampments, driving their flocks from pasture to pasture as the water supply fails. Transportation is by caravan. The negroes cultivate millet, barley, etc., gather gums for export, and catch and dry fish. The nomads raise camels, horses, cattle, sheep, and goats. Salt exists in great abundance. See FRENCH WEST AFRICA.

MAURITIUS. An island in the Indian Ocean 550 miles east of Madagascar; a British crown colony. Area 720 square miles. At the 1911 census, the total population was 368,510; population inclusive of military, 370,393 (222,361 Indo-Mauritians, 35,526 other Indians, 3662 Chinese, 108,844 persons of European, African, or mixed blood). The natives of European race are in large part French creoles. Port Louis, the capital, had (1911) with suburbs, 50,060 inhabitants; Curepipe, 17,173; Mahébourg, 4068. The cultivation of sugar-cane is the staple industry. Export of sugar (1913) 187,771,850 kilos; estimated value, 30,700,697 rupees; rum, 22,330 rupees; vanilla, 35,330 rupees; aloe fibre, 853,568 rupees; coconut oil, 63,474 rupees; molasses, 61,300 rupees. Total imports and exports (1913), including shipping charges on home products, 37,003,209 rupees and 33,616,206 rupees respectively. Revenue 1912-13, 11,035,641 rupees; expenditure, 10,235,605 rupees; customs revenue, 4,024,766 rupees. Tonnage entered and cleared (1913), 833,027. External debt, June 30, 1913, £1,285,390.

MAYO FOUNDATION FOR MEDICAL EDUCATION AND RESEARCH. See HOSPITALS.

MAYOTTE AND THE COMORO ISLANDS. A group of islands belonging to France, administered under the Government of Madagascar. Area, 2168 square kilometers (837 square miles); population, as estimated Jan. 1, 1914, 97,900, of whom indigenes 96,619, Asiatics and Africans 754, and whites 527. Imports and exports 1912, 1,956,557 and 5,108,510 francs respectively (1,133,429 and 2,700,652 francs in 1909).

MEAT PRODUCTION. See STOCK RAISING AND MEAT PRODUCTION.

MEDICAL PROGRESS. The trend of medical progress is toward prevention of disease and securing longevity. The control of epidemics becomes of great importance, with the rapidly increasing economic value of life and time (see BACTERIOLOGY; DIPHTHERIA; HOOKWORM DISEASE; OCCUPATIONAL DISEASES; PELLAGRA; TYPHOID FEVER; TYPHUS FEVER; SMALLPOX; SERUM THERAPY; VACCINE THERAPY). Equatorial countries furnish us with diseases which often are carried into the temperate zones, and must be controlled (see BERIBERI; CHOLERA; INSECTS, PROPAGATION OF DISEASE BY; LEPROSY; MALARIA; OROYA FEVER; PLAGUE; SLEEPING SICKNESS; TROPICAL MEDICINE). CANCER, the scourge which grows in fatality, and TUBERCULOSIS, which is diminishing in its power to cause deaths, had attention in 1915 (see CANCER; ROENTGEN RAYS; TUBERCULOSIS; TRUDEAU, EDWARD LIVINGSTON). Among the more unusual diseases observed or specially studied are

FOURTH OF JULY INJURIES (TETANUS), ROCKY MOUNTAIN SPOTTED FEVER, and RABIES. Some new remedies were the subject of research (CEPHAELINE; COAGULEN; HISTAMINE; LABOSAN; LEUCOCYTE EXTRACT; LUTIN; THORIUM; THEOCIN; SALVARSAN AND NEOSALVARSAN). The special anæsthesia in childbirth, so vaunted by the laity, is discussed under TWILIGHT SLEEP. The questionable AUTOLYSIN is discussed also under CANCER. The dangers of ALCOHOL are again set forth. Other medical items and annual statistics are found under their proper captions.

MEDICAL SCHOOLS. See UNIVERSITIES AND COLLEGES.

MERCIER, CARDINAL. See BELGIUM, *History, The Treatment of Cardinal Mercier.*

MERCURY. See QUICKSILVER.

MERCURY BICHLORIDE. See MALARIA.

MERBILL, STUART. American poet, died Dec. 3, 1915. He was born in 1863 at Hempstead, L. I. At an early age he went to France, where he studied at the Lycée Michelet and the Lycée Condorcet. He obtained such a mastery of French that he gained a high reputation as a writer of books in that language. He returned to the United States and studied law at Columbia University from 1885-89, but afterwards returned to France, which was his home for the remainder of his life. He became one of the most successful poets of the Symbolist School. The volume which made him conspicuous as a writer was *Les gammes* (1887). Then came *Les fastes* (1895) and *Les quatre saisons* (1900). His *Pastels en prose* appeared in 1895. He contributed to various periodicals, including: *L'Ermitage*, *La plume*, and *Le mercure de France*.

MESOTHORIUM. See CHEMISTRY, INDUSTRIAL, *Mesothorium*.

METALLURGY. Progress in metallurgy during 1915, as in other fields of scientific and technical activity, was influenced by war conditions. Naturally there was great demand for gold, which led to increased efforts to mine and refine this rare metal. There was also evident need of copper, zinc, and lead by the belligerent countries, shared of course by the countries supplying them with munitions, and this naturally stimulated the production and refining of these metals also. In the manufacture of various metals and alloys the closing down of sources of supply led to attempts to produce metals from ores that previously had not been worked, or had not been considered profitable, and this was especially true of metals used for alloys. In iron and steel there was a marked increase in the use of the electric furnace, and in refining gold, silver, copper, and zinc, the increased use of the flotation process was one of the most important features of the year. The following paragraphs, based largely on the authoritative reviews in the *Engineering and Mining Journal*, *Iron Age*, and *Metallurgical and Chemical Engineering*, indicate the general trend of metallurgical advances during the year.

GOLD AND SILVER. The development of the flotation process as a means of concentrating gold-bearing ores, as well as for lead, zinc, and copper, was an interesting feature of the year. It was uncertain how far this new process would encroach upon amalgamation and cyanidation, but mining engineers were busily engaged in further experiments in mill and laboratory. This method consists essentially of pulverizing

the ore and mixing it with a fat or oil together with an acid or a soluble neutral or acid salt, so that the free metal or metallic portion of the ore unites with the oil and the metal may be separated from the quartz or other rock by washing. This flotation process was patented as long ago as 1886 by Mrs. Carrie J. Everson, of Denver, Colo.

The flotation process made use of pine oil, which had become a source of embarrassment to wood distillers, as there was little market for it. This new development employed also rosin, rosin oil, pine tar, pine tar oil, wood creosote, and even crude pyroligneous acid, so that industries supplying these materials were correspondingly benefited, so much so in fact that cheaper oils, notably those obtained from coal tar and fractions from the distillation of coal, were being used. For this new process a method was developed, also, by which oil was used and air bubbles employed to lift the minute particles of the ore.

Some metallurgists reported that it was possible to float certain gold and silver ores in such a manner as to displace or supplement cyanidation, and the concentrates thus obtained in many cases could be sent direct to the smelters. Unfortunately it was not considered possible to float gold and silver ores in the cyanidation solution, but it was believed that it would be possible to concentrate ores containing an excess of cyanide, especially if this treatment were carried on at an isolated place, so as to obtain an enriched product and diminished freight charges. Flotation was extensively used in the mines where silver was produced in the form of a sulphide, particularly when the ores were rather low grade, and in this connection it was thought that a process of flotation concentration was cheaper and more easily applied than the cyanide process, although of course fine grinding was a necessity; but in many other processes grinding problems had to be considered and were essentially solved.

In gold milling the familiar stamp mill was being challenged by the rolls as used in copper milling and by the ball mill, both of these being said to be more economical as regards first cost and operation. In cyanidation there was little new development of the process. The continuous counter decantation was further developed and it was believed that precipitation methods were perhaps the most promising in this field. One of the processes that was making headway during the year for treating gold was that of aluminum precipitation from cyanide solutions.

LEAD. In 23 American plants, smelting silver lead ores, with 124 blast furnaces, there was but little change in practice and few metallurgical developments. One of the features of the year was the use of mechanical rabbling instead of the hard, unsanitary hand labor in the open hearth furnaces in the lead industry in the Mississippi Valley. This method was devised by W. E. Newman. By it an 8-foot hearth—an increase over the ordinary ore hearth of 4 to 5 feet in length—tended by six men in 24 hours, and treating about 7000 pounds of galena concentrates, could do two and one-half times as much work as was done by the old method. While the same number of men were required, the effort was much lighter and the rate of production the same in winter as in summer.

COPPER. Metallurgical advances in the treat-

ment of copper during 1915 were restricted in the main to the few great companies whose engineering and metallurgical staffs were so thoroughly organized that they were able to develop policies independent of commercial conditions. On all sides the plants were working so as to secure a maximum production, and metallurgists were concerned rather with routine work for this end than with experimentation. Where flotation was used many developments were being reported during the year. It was found possible in many cases to avoid the use of acid and to substitute cheap oils for expensive chemicals as froth-forming mediums. It was even proposed to treat tailings running as low as 1 per cent copper, and 25 per cent concentrates were being made from 2 per cent ore. The important advances were made only with the sulphite minerals where fine grinding must be done, but plans were being proposed and tried for treating oxidized minerals so that flotation methods could be applied to them.

A furnace for the use of coal dust firing and side charging was constructed at Anaconda and operated with increased efficiency, and a number of furnaces were being arranged for oil fuel, the use of the latter of course depending on relative costs. In reverberatory furnaces marked developments were being experienced, while at Anaconda a converter was being used for re-treating converted slag so as to save a certain amount of ore that otherwise would be wasted. At several refineries important methods in copper refining were in use. The slimes at one large plant were treated with strong sulphuric acid, to convert the copper into sulphate, and the resulting mud was then heated to a temperature below the point of fusion or of decomposition of copper sulphite, so that on leaching with hot water, the copper could be extracted as a nearly pure sulphite. Improvements in the electrolytic purification cycle were also worked out, and by-products were obtained and impurities eliminated from the liquors in an active electrolytic tank.

ZINC. The production of spelter by any available process occupied the attention of all interested in the zinc industry in the United States during 1915, rather than the development of new methods or even the making of improvements. So great was the demand for the metal that even important plants were worked with comparatively low efficiency to secure advantage of the high prices. The improvements of the year were concerned merely with details so as to enable a better extraction of zinc from low grade ore to be secured and to ascertain how such ores could be handled in the furnaces. Some plants installed mechanical gas producers and coal-dust firing was being tried experimentally at one large works. In some furnaces in the Kansas-Oklahoma region, for blend-roasting the arch of the Zellweger furnace was being lowered, and in other cases the furnace was being doubled, the rabble being carried on the same shaft for the two furnaces in order to save fuel and reduce the admission of unnecessary air. Commercially the most important feature of the year was the construction of the smelter at Donora, Pa., by the Edgar Zinc Company, a subsidiary of the United States Steel Corporation. This plant was designed for the smelting of 100,000 tons of zinc ore annually, and the production of about 40,000 tons of spelter, some

9000 retorts forming the distilling equipment. The new plant was begun in June, and spelter was first made on October 20th, 4 months and 10 days from the beginning of construction. The new plant comprises 6 Hegeler roasting-furnaces and 10 Hegeler distilling-furnaces, each of 912 retorts.

One of the metallurgical tendencies of the year was the refining of common spelter by re-distillation, and a large tonnage of the refined metal was being produced in that way. In the United States the ordinary ore furnace was used, whereas in the Scandinavian countries the electric furnaces were employed.

The successful electrolytic production of zinc direct from ore on a large scale was the most important event in the metallurgy of zinc in 1915. This was done at Anaconda, Mont., where the production of electric spelter at the rate of about five tons per day was begun, and the results were so favorable that the erection of a plant able to produce 35,000 tons was begun at Great Falls, Mont. This process consisted in concentrating the zinc ore, preferably by flotation, and then roasting the concentrates to produce a calcine containing from 2 to 3 per cent sulphur, without allowing the temperature to exceed 1350° F., under which condition the formation of zinc ferrite is not pronounced. This calcine is then treated with a solution containing sulphuric acid to dissolve the zinc and the iron. After further chemical treatment the solution goes to the electrolytic cells where the zinc is deposited on aluminum plates from which the deposit is stripped every 48 hours and sent to the melting furnace. Electrolytic spelter had been produced at Winnington, England, and during 1915 was also produced on a commercial scale by the Weedon Mining Company, of Welland, Ontario, while experiments at Keokuk, Iowa, were in progress by R. G. Hall.

IRON AND STEEL. The iron and steel industry during 1915 followed the improvement in trade conditions and the demand for material incidental to the war. (See IRON AND STEEL.) As regards metallurgy and technical developments there was but slight progress to be recorded for the year. The depression of the first half of the year did not inspire research and experimental developments, while in the second half most of the large American works were so actively engaged that their metallurgists and technical men were not available for work not concerned with actual production. In Europe conditions were obviously affected by war. Some attention was paid in the United States to the design and operation of hot blast stoves so as to obtain a greater number of square feet of heating surface per stove, and corrugated checker bricks were used, the general tendency being to reduce the size of the checkers and the thickness of the bricks. Various insulating materials were used to cut down the heat loss from the stove to the bustle pipe, and more attention was paid to the insulation of the exterior linings of the stoves. The hot blast mains, and the bustle pipes themselves. Forced circulation of the gas in the stoves was also tried, and further experiments with this system were expected. For blowing engines, both gas and steam were employed in the new plants. The largest furnace plant building during the year was being provided with a steam blowing engine using high pressure and very high superheat system. A new method of

handling slag during the year was developed to a point of industrial importance. By this process, the slag, after being poured on a bed, is torn into small pieces by the ripping of underlying chains. These pieces can be removed by grab buckets and loaded into cars, or otherwise disposed of, and the slag so produced was excellent for concrete purposes.

Gradually new methods of steel production were replacing older ones, and especially the introduction of duplexing or the combination of the two fundamental methods, namely the Bessemer converter and the open hearth furnace, where the silicon and most of the carbon is blown out in the converter and then the material is transferred to the open hearth furnace for dephosphorization. It was claimed for this process that the rapidity of working in the open hearth furnace was increased, and a greater output secured, so that the steel could be produced more profitably than in the straight open hearth plant, and with a reduction of capital charges.

The casting of steel ingots which had been under discussion for a number of years, especially in the production of railway rails, was still receiving attention, and several processes designed to secure an ingot of better quality were being used at large plants. One of these was the Gathman process where the top of the mold was made thin so as to reduce the chilling action in the upper part of the ingot, and keep it hot to feed the pipe; while in the Kenney, the top of the ingot mold was lined with a dry sand sleeve set in the recess around the top of the mold, with the result that the metal was thinned down and insulation provided between the steel and the mold. It was realized that by casting the ingots with the big end up more uniform material could be secured, but various difficulties in the way of stripping the ingots prevented successful efforts on a commercial scale in this direction.

CAST IRON. During the year the Stoughton process for melting iron in cupolas where the greater portion of the coke was replaced with oil, was introduced commercially, with success. The aim was to secure a reduction in fuel cost, especially on the Pacific Coast, where oil was cheap and coke high, but a second and important effect was to secure a very small increase in sulphur, in fact only about one-fifth of what was experienced with coke, in good practice. Another feature of the year was the large use of so-called Johnson iron, a coke iron which is a substitute for and improvement upon charcoal iron, produced by the introduction of oxygen. Experiments were under way, and in this method castings may be produced directly from the blast furnace without remelting, which are of superior quality, both on account of the introduction of oxygen and the absence of sulphur.

ELECTRO-METALLURGY. Electro-metallurgy of both iron and steel, and particularly the development of the electric furnace, showed progress in 1915. Important applications were not only to the production of steel castings of ordinary analysis but to the production of those more solid and free from blow-holes than those produced by the baby Bessemer or the open hearth. In the second place, there was an important tendency toward the production of special alloy steels of high grade to be used in motor cars, aeroplanes, tools, and for other purposes where

certain physical properties and quality are essential. In this process the electric furnace stood out on account of the absolute control of temperature, as any oxidized gases could be excluded from the bath, and a material even better than crucible steel was being made. In fact some authorities seemed to believe that the electric furnace would soon make an end of crucible steel.

In the manufacture of electric steel the United States led the world in 1915, outstripping Germany, which a year before had first rank. There was reported an increase during 1915 for the United States and Canada of some 88 per cent, or from 41 furnaces Jan. 1, 1915, to 73 on December 31st of the same year. At the beginning of the year there were only 19 Heroult furnaces in the United States and Canada, but on December 31st there were 43, which were being used not only for steel casting but for tool steel and the special steel industry which was increasing by leaps and bounds in the United States.

In Europe the demand for special castings and shell steel gave a decided impetus to electric furnace activity, and in England there was an increase to 46 furnaces from 16 at the beginning of the year, the Heroult furnace being the one in most use. Of the 28 new furnaces installed in England, 15 were Heroult, 10 Grünwall, and three Snyder. One of these was induction, and one Rennerfelt. In France, three Heroult furnaces were built in 1915, and one Rennerfelt, while in Russia two Rennerfelt furnaces were reported as installed. In Sweden five additional Rennerfelt furnaces were built, making a total of 23, and in Norway there was an increase from 2 to 6. In Germany the production of electric steel was reported as having increased materially with the stimulation of the producing power of existing plants, due to war needs, and there were seven new installations, bringing the total up to 53, while the number of electric plants in Austria remained unchanged.

The electric furnaces in use during 1915 had a furnace capacity of over 1,000,000 horse power, and an estimate was made of 100,000 tons per annum of electric steel produced in the United States.

ALLOY MATERIALS. During the year much progress was noted in American refineries concerned with the manufacture of alloys and refining from the ores of those metals that enter into their composition. Ferrosilicon, ferromanganese, ferrochrome, tungsten, ferrotitanium, cobalt, and ferrovanadium were all in active demand, and the supplies of the raw materials were in many cases cut off from Europe, while in other cases American ores were being worked so as to obtain material for export. The cutting off of materials led to the exploitation of American ore deposits, and the development of plants for their treatment, which from a somewhat confused basis at the beginning of the year gradually settled down so that economical and scientific methods of working were introduced. Thus, for the manufacture of ferromanganese the electric furnace was employed. Before the war little of this material was made in the United States. Supplies from abroad were cheap and abundant, but in 1915 it was being produced in blast furnaces and, as stated, in the electric furnace. Ferrochrome was being produced electrolytically, and by the thermit process in the

United States, while deposits of tungsten were being worked up, although the annual product of the United States was less than 2000 tons of tungsten ore. In short, a number of metallurgical industries were being developed as a result of the war conditions, and American metallurgists were meeting the demands put upon them as effectively as possible.

Bibliography. Among the more important books on metallurgy published during 1915 were the following: O. Bauer and E. Deiss, *The Sampling and Chemical Analysis of Iron and Steel*, translated from the German by William T. Hall and Robert S. Williams; I. E. Clennell, *The Cyanide Handbook*, second edition; George Lunge (editor), *Technical Methods of Chemical Analysis*, vol. iii; H. W. MacFarren, *Practical Stamp Milling and Amalgamation*, third edition; James Park, *A Test Book of Practical Assaying*; Walter Rosenhain, *An Introduction to the Study of Physical Metallurgy*; Francis Andrew Thomson, *Stamp Milling and Cyaniding*; Charles H. White, *Methods of Metallurgical Analysis*; Edward S. Wiard, *The Theory and Practice of Ore Dressing*.

METAPHYSICS. See PHILOSOPHY.

METEOROLOGY. The question of the influence of volcanic outbursts upon the weather continued to engage the attention of meteorologists in 1915. A few years previously, Humphreys examined the records of the exceptionally cold years which have occurred since 1750, and came to the conclusion that the volcanic dust projected into the upper atmosphere during such outbursts must have been a factor in the production of past climatic changes. In support of his conclusions he instanced the cold periods which followed many of the notable eruptions of recent times, including those of Krakatoa in 1883, the West Indian volcanoes, La Pelée and La Soufrière, in 1902, and Katmai in 1912. Similar conclusions were reached by Abbot and Fowle. Arctowski recently reexamined the temperature-lowering effect of these three eruptions in the light of temperature data from all parts of the globe, and found that, while the Krakatoa eruption affected the yearly mean temperature greatly, lowering it to the extent of 3.4°F., the influence of the eruptions of 1902 and 1912 was very slight, or none at all.

RAINFALL OF THE UNITED STATES. In three studies on the rainfall of the Northeastern, the Eastern, and the Western United States, respectively, published in the *Monthly Weather Review*, B. C. Wallis presented a series of charts showing rainfall conditions by means of what he terms "equipluves" instead of the customary isohyets. An equipluve is a curve showing the percentage departure of the rainfall from the monthly norm, the latter being calculated on the assumption that the total amount of rain precipitated in any locality is evenly distributed through the year. The equipluve for the norm is numbered 100, and an equipluve numbered $100 + n$ indicates that the rainfall at the places through which it passes is n per cent above the norm. His conclusions for the Northeastern States show that in this region a wave of dryness moves southeastward during the period when the temperature is falling, from September to the end of January, and a wave of wetness moves in the same direction during the period of rising temperature, i.e. from May to August. For the Eastern States as a whole,

he finds that there are three rainfall belts separated by lines which run in a southwesterly direction from Toledo, Ohio, to San Antonio, Texas, and from Hartford, Conn., to Mobile, Ala., respectively. The belt to the northwest of the first line is characterized by summer rains and winter dryness; the intermediate belt, by rains at all seasons; and the most easterly belt, by heavy total precipitation due to the proximity of the ocean, with the summer rains predominating. On the whole, it may be said that the date of maximum rainfall tends to become later as the coast is approached from the northwest. In the Western States, three regions are distinguished: (1) the Far West, including the coast lands, with heavy winter rains; (2) the Mountains, never very wet, never very dry; (3) the Eastern Slopes, with great rainfall intensity in the North from April to June, and in the South from July to September.

Summing up his conclusions for the whole country, he found that the rainfall of the United States is determined by (1) continental influences which are exerted over a broad triangle of country, with the vertex to the south and with the edge of the Rocky Mountains as the eastern limb of the triangle; (2) oceanic influences exerted upon the coastal lowlands, (a) on the west from the Pacific and (b) on the east from the Atlantic; (3) intermediate regions, (a) the Rockies in the west and (b) the western Appalachians in the east; and (4) direct solar influences which are manifest with some elements of variety along the southern boundary as far west as Yuma, Ariz.

CLIMATIC PROVINCES OF THE WESTERN UNITED STATES. In an interesting paper in the *Bulletin of the American Geographical Society* for January, 1915, W. G. Reed formulated a new classification of the climatic provinces of the Western United States. After a discussion of the applicability to this region of the classifications proposed by Supan, Köppen, Herbertson, and Dryer, he points out that no satisfactory grouping of localities on a climatic basis can be obtained unless both temperature and rainfall conditions are taken into account. In the Western States the controlling factors are the proximity of the great body of the Pacific Ocean with its equable temperature, and the Sierra-Cascade range running north and south, which serves as a climatic divide. The great contrast between the conditions east and west of this divide serves as the primary basis of classification. The climate of the region to the west of the mountains is distinguished by mild temperatures, marked subtropical winter maximum of rainfall, and summers dry or with light cyclonic rains, except in the mountains where summer thunder showers may occur. Between the northern and southern portions of this region, which is termed the Pacific Province, certain differences are evident, the northern, or Oregonian, District being characterized by somewhat lower temperatures, the common occurrence of snow at low altitudes in winter and of light cyclonic rains in summer, which are not found in the southern, or Californian, District. Differences of annual rainfall serve to subdivide the Oregonian District into five, and the Californian District into three, regions. East of the dividing range the rainfall is markedly less than in the same latitudes in the Pacific

Province, and consequently this region is called the Rain Shadow Area. Its climate is characterized by large diurnal and annual ranges of temperature, and generally deficient precipitation, arid in the south, and semi-arid in the north. Here, too, two districts can be distinguished, the northern, or Snake River, District, with an annual rainfall of from 10 to 20 inches, and the southern, or Great Basin, District, in which the annual rainfall is generally less than 10 inches; but, owing to the fact that local influences, such as altitude, are more potent in affecting the amount of rainfall than in the Pacific Province, this division is less satisfactory.

POPULAR MISCONCEPTIONS CONCERNING THE WEATHER. In an article in the *Popular Science Monthly* for February, 1915, A. H. Palmer, of the United States Weather Bureau enumerated and discussed briefly 25 of the more common misconceptions concerning the weather. Among them may be mentioned the supposed influence of the moon and other heavenly bodies, also of forests, on the weather; the deep-seated belief that the climate is changing; the connection between the weather of a particular day, e.g. February 2nd, and St. Swithin's Day, and that of subsequent weeks or seasons; the belief that storms originate at Medicine Hat; the tradition that lightning never strikes twice in the same place; the production of rain attending the old-fashioned celebration of Independence Day, or during great battles; the exaggerated belief in the difference between the climate of cities and that of the country; and the popular superstition of the Indian summer. Emphasis was laid on the fact that in none of the cases enumerated is the superstition supported by evidence derived from exact observation, and that, while a systematic science of the weather is only in the making, still it has advanced far enough to dispose of many time-honored misconceptions. The continued belief in these misconceptions is attributed to the fact that the sciences of meteorology and climatology are of recent growth, and to the failure of the general public to keep pace with their progress.

HEIGHT OF THE AURORA BOREALIS. Prof. Carl Störmer, to whose researches on the aurora borealis reference was made in the *YEAR BOOKS* for 1911 and 1913, published a preliminary report on the results obtained during his expedition to Bossekop, in Northern Norway, in 1913. About one-sixth of the material secured has been worked up, and has yielded some interesting results. Photographs of the aurora were taken simultaneously by Störmer and his assistant Birke-land, the former stationed at Bossekop, the latter at Store Korsnes, about 17 miles south of Bossekop. Owing to the fact that the measurements were made during a period of minimum solar activity, it was expected that the electric corpuscles proceeding from the sun would have comparatively slight penetrating power and would be arrested in the higher regions of the atmosphere, giving rise to auroral displays at a greater altitude than those observed on the occasion of Störmer's earlier expedition of 1911. This expectation was fully realized. From nearly 600 measurements, the mean height of the aurora above the earth's surface was found to be about 75 miles. Few of the measurements made gave less than 55 miles, and one as high as 144 miles was obtained.

METHODIST BROTHERHOOD. An organization of the Methodist Episcopal Church, authorized and empowered by the General Conference in 1908, and formed by the affiliation of two general brotherhoods—the Wesley Brotherhood, and the Brotherhood of Saint Paul. The aim of the brotherhood is to utilize and develop the features and activities of the church relating to men, to reach and win the unchurched men and boys, and to provide them with a task commensurate with their powers and with the importance of the gospel ideal. Additional legislation passed by the General Conference in 1912 improved the usefulness of the brotherhood. A considerable literature has been created, consisting largely of 4, 6, and 8-page folders, each dealing with some aspect of men's work, and written for the express purpose of inciting other men elsewhere to similar efforts. On Nov. 11, 1914, a coalition was formed between the Methodist Brotherhood and the Adult Bible Class Movement. The officers of the Methodist Brotherhood in 1915 were: President, Wilford M. Wilson; general secretary, William S. Bovard.

METHODIST EPISCOPAL CHURCH. The total number in full membership in this denomination in 1915 was 3,619,920, with 413,203 probationers, 30,654 churches, and 20,524 ministers. This represents a gain of 54,329 in membership over that of 1914, a gain of 201 in churches, and of 152 in ministers. The total membership, including probationers, in 1915, was 4,033,123; the total net increase over 1914 was 104,089. The total number of Sunday schools in 1915 was 36,250, as compared with 35,830 in 1914; of Sunday school officers and teachers, 405,429, as compared with 392,968 in 1914; of Sunday school scholars, 4,497,464, as compared with 4,183,570 in 1914. The total membership of the Epworth League in 1915 was 849,830. The estimated value of church property in 1915 was \$212,325,468, and of parsonages, \$35,210,517. The total corporate wealth of the denomination in 1915 is estimated at \$327,346,017.

The denomination has mission conferences in Austria-Hungary, Denmark, Germany, Finland, Bulgaria, Burma, East Central Africa, North Africa, North China, Norway, Sweden, Switzerland, Porto Rico, France, New Mexico, Spain, West China, etc. Extensive missions are maintained on four continents as follows: Asia: India, Burma, Malaysia, the Philippine Islands, Java, Borneo and Sumatra, China, Japan, and Korea. Africa: Liberia, Angola, Madeira Islands, Southern Congo, Portuguese East Africa, Rhodesia, Algeria, and Tunis. South America: Argentina, Paraguay, Uruguay, Bolivia, Chile, Peru, and Panama. Europe: Italy, France, Bulgaria, and Russia. Thus in all 34 different countries are reached, and the gospel is preached in probably double that number of languages. There were in 1915, 1426 missionaries in foreign fields, assisted by 11,300 native workers, and an enrolled membership of 402,258, besides baptized children and unbaptized adherents, bringing the total to 635,395, a net gain for the year of 55,523. The total receipts in 1915 for missionary purposes were \$1,188,243; disbursements, \$1,171,786. The Methodist Episcopal Church has been represented on both sides of the war in all the countries involved, except Serbia, by its own sons and daughters.

Under the general charge of the board of education are maintained in the United States and

abroad 356 educational institutions, including 43 colleges and universities. The most important of these are De Pauw University, Indiana; Northwestern University, Illinois; University of Southern California; Ohio Wesleyan University; Boston University; and Wesleyan University. There are 10 theological schools for white students, and 5 for colored.

Besides the missionary and Sunday school organizations and the board of education, there are: the Methodist Book Concern, through which the publications of the denomination are issued; the Epworth League, which is the association for the young people of the church; the Methodist Federation for Social Service; the Freedman's Aid Society; the Deaconess Work; and the Temperance Society. The 32nd general conference will open at Saratoga Springs, N. Y., on May 1, 1916.

METHODIST EPISCOPAL CHURCH, SOUTH. This body, which includes the greater number of Methodists in the Southern States, had in 1915, according to official statistics, 2,035,236 members, including local preachers, a gain of 38,350 over 1914. Traveling preachers, not including supplies, numbered 7227, a gain of 24 over 1914; Sunday school officers and teachers, 140,137, a gain of 5207 over 1914; Sunday school scholars, 1,581,889, a gain of 101,912 over 1914; and the Epworth League members, 123,663, a decrease of 9717, as compared with 1914. There were 17,068 churches, a gain of 62 over 1914; church property was worth \$57,677,908, as compared with \$53,683,491 in 1914; the number of parsonages was 5368, and their value, \$11,127,545.

In the territory in which the activities of the denomination are found, there are 330 districts. The total salaries for the preachers in charge amounted in 1915 to \$4,795,841, the average ministerial salary being \$772. The total amount expended for purposes of benevolence, not including gifts for endowments and buildings for colleges, was \$1,449,710 in 1915, or 70.3 cents per capita.

There were 12 active and 2 superannuated bishops in 1915. The official headquarters of the denomination are in Nashville, Tenn., where the publishing house is located. A committee of the Women's Missionary Council is in charge of and maintains 20 Wesley houses, which are social settlements for the whites, and 3 Bethlehem houses for the negroes. About 50 deaconesses give their entire time to social service. The next general conference will be held in May, 1918.

METHODISTS, BRITISH. The following statistics of British Methodism for 1915 are from the Methodist Publishing House of London. They include not only Great Britain and Ireland, but Methodist churches and missions in foreign fields. The returns for Canadian Methodism will be found in a separate article. British Methodists at home and abroad had, in 1915, a total of 1,810,044 church members and probationers; 10,578 churches; 64,562 lay preachers; 26,078 Sunday schools; 314,295 Sunday school officers and teachers; and 2,579,145 Sunday school scholars.

WESLEYAN METHODISTS. This is the largest branch of the denomination in Britain. It has of church members and probationers, 922,796; churches, 17,671; ministers, 3861; lay preachers, 30,221; Sunday schools, 10,794; Sun-

day school officers and teachers, 143,182; scholars, 1,121,682. Of this total the Wesleyan Methodists of Great Britain had: Church members and probationers, 502,809; churches, 8493; ministers, 2576; lay preachers, 19,418; Sunday Schools, 7531; Sunday school officers and teachers, 129,249; scholars, 922,773. In Ireland the Wesleyan Methodists had: Church members and probationers, 28,020; churches, 548; ministers, 244; lay preachers, 646; Sunday schools, 337; Sunday school officers and teachers, 2347; scholars, 24,121. In foreign missions there were 174,808 Wesleyan Methodist church members and probationers; 4458 churches; 729 ministers; 5740 lay preachers; 2068 Sunday schools; 8517 Sunday school officers and teachers; and 132,188 scholars. In the French Conference of Wesleyan Methodists there were 1733 church members and probationers; 131 churches; 35 ministers; 84 lay preachers; 36 Sunday schools; 163 Sunday school officers and teachers; 2251 scholars. In the South African Conference there were 135,426 church members and probationers; 4041 churches; 277 ministers; 4333 lay preachers; 822 Sunday schools; 2906 Sunday school officers and teachers; 40,349 scholars.

PRIMITIVE METHODISTS. Church members, 206,812; churches, 4903; ministers, 1149; lay preachers, 15,537; Sunday schools, 4204; officers and teachers, 57,233; Sunday school scholars, 447,050.

UNITED METHODIST CHURCH. Church members, 185,769; churches, 3013; ministers, 848; lay preachers, 6156; Sunday schools, 2286; Sunday school officers and teachers, 40,744; scholars, 294,039.

WESLEYAN REFORM UNION. Church members and probationers, 8526; churches, 206; ministers, 25; lay preachers, 500; Sunday schools, 195; officers and teachers, 3000; scholars, 23,172.

INDEPENDENT METHODIST CHURCHES. Members and probationers, 9215; churches, 163; ministers, 411; Sunday schools, 160; Sunday school officers and teachers, 3106; scholars, 26,677.

AUSTRALASIAN METHODIST CHURCH. Members and probationers, 149,878; churches, 5147; ministers, 985; lay preachers, 8634; Sunday schools, 3849; Sunday school officers and teachers, 21,964; scholars, 203,365.

NEW ZEALAND METHODIST CHURCH. Members and probationers, 24,218; churches, 459; ministers, 198; lay preachers, 928; Sunday schools, 411; Sunday school officers and teachers, 3020; scholars, 29,917.

JAPAN METHODIST CHURCH. Members and probationers, 13,838; churches, 245; ministers, 232; Sunday schools, 340; Sunday school officers and teachers, 1148; scholars, 23,605.

METHODISTS, CANADIAN. The Methodist Church in Canada was formed in 1883 by the union of the Canadian branches of the Wesleyan Methodist Church, the Methodist Episcopal Church, the Primitive Methodist Church, the Methodist New Connexion Church, and the Bible Christian Church. The territory covered by the operations of the Church includes the Dominion of Canada, Newfoundland, Bermuda, and mission fields in China and Japan. For administrative purposes there are 12 conferences: Toronto, London, Hamilton, Bay of Quinte, Montreal, Nova Scotia, New Brunswick and Prince Edward

Island, Newfoundland, Manitoba, Saskatchewan, Alberta, and British Columbia.

In 1915 there was a total membership of 376,761; ministers, 2871. Under the educational control of the Church there are 17 colleges and universities. The leading institutions are: Victoria University, Toronto; Mount Allison University, Sackville, N. B.; Wesleyan Theological College, Montreal; Wesley College, Winnipeg. The total value of all the buildings and endowments is \$7,200,391.

There are 3824 Sunday schools, with 420,210 scholars, and 41,929 officers and teachers. The amount raised in 1915 for ministerial support was \$1,794,550; total missionary income, \$651,450.

The principal officers of the Church in 1915 were as follows: Samuel Dwight Chown, general superintendent; Albert Carman, general superintendent emeritus; T. Albert Moore, secretary of the General Conference and of the department of social reform and evangelism; William Briggs, book steward; W. B. Creighton, editor of the *Christian Guardian*; A. C. Crews, editor of Sunday school publications; D. W. Johnson, editor of the *Wesleyan*.

METHODISTS, COLORED. The colored branches of the Methodist Episcopal Church include the Colored Methodist Episcopal Church, which in 1915 had 293,410 full members, 41,261 probationers, and 17,281 non-resident members; the African Methodist Episcopal Zion Church, with 568,608 members, 3180 churches, and 3552 ministers; the African Methodist Episcopal Church, with 620,000 members, 6000 churches, and 5000 ministers; the Union American Methodist Episcopal Church (Colored), with 19,000 members, 212 churches, and 170 ministers; the African Union Methodist Protestant Church (Colored), with 4000 members, 125 churches, and 200 ministers; the Reformed Zion Union Apostolic Church (Colored), with 3059 members, according to the 1906 census, 45 churches, and 33 ministers; the Colored Methodist Episcopal, with 240,798 members, 3196 churches, and 3072 ministers; and the Reformed Methodist Union Episcopal Church (Colored), with 4397 members, 58 churches, and 72 ministers.

METRIC SYSTEM. See **WEIGHTS AND MEASURES.**

METROPOLITAN OPERA COMPANY, NEW YORK. See **MUSIC, The United States, Opera, and *passim*.**

MEXICO. A federal republic situated between the United States and Central America. The country is officially called both *Estados Unidos Mexicanos* and *República Mexicana*. The capital city is Mexico, in the Federal District. On account of the continual civil war and the resulting chaotic conditions in all industry, business, and administration, Mexican statistical publications were suspended during 1915.

AREA AND POPULATION. The area by states and the population in 1900 and in 1910 (census of October 27th) are shown in the following table:

	Sq. km.	Pop. 1900	Pop. 1910
Agascalientes	7,692	102,416	120,511
Baja California *	151,109	47,624	52,272
Campeche	46,855	86,542	86,661
Coahuila	165,219	296,938	362,092
Colima	5,887	65,115	77,704
Chiapas	71,302	860,799	438,843

	Sq. km.	Pop. 1900	Pop. 1910
Chihuahua	283,214	827,784	405,707
Distrito Federal † . . .	1,499	541,516	720,758
Durango	109,495	370,294	488,175
Guanajuato	28,868	1,061,724	1,081,651
Guerrero	65,480	479,205	594,278
Hidalgo	22,878	605,051	646,551
Jalisco	86,752	1,158,891	1,208,855
México	28,909	934,468	989,510
Michoacán	58,594	935,808	991,880
Morelos	4,911	160,115	179,594
Nuevo León	64,838	827,937	865,150
Oaxaca	92,443	948,688	1,040,398
Puebla	88,653	1,021,183	1,101,600
Querétaro	11,688	232,389	244,668
Quintana Roo *	49,914	9,109	9,109
San Luis Potosí	62,177	575,432	627,800
Sinaloa	71,880	296,701	323,642
Sonora	198,496	221,682	265,388
Tabasco	26,871	159,834	187,574
Tamaulipas	79,861	218,948	249,641
Tepec *	28,371	150,098	171,173
Tlaxcala	8,974	172,815	184,171
Vera Cruz	72,216	981,080	1,132,859
Yucatán	41,287	809,652	839,613
Zacatecas	63,886	462,190	477,556
Islands	4,042	.....	.....
Total	1,987,201†	13,607,259	15,160,369

* Territory.

† Federal District.

‡ 767,258 square miles.

In 1900 pure whites, and nearly pure, constituted about 19 per cent of the total population; persons of mixed Indian and white blood, about 43 per cent; Indians, about 38 per cent. In 1910 Spanish-speaking persons numbered 13,143,372. Most of the remaining inhabitants spoke Indian languages. Roman Catholics numbered 15,033,176 in 1910; Protestants, 68,839. Population of the larger cities in 1910, with percentage of increase over 1900: Mexico, 471,066 (36.65); Guadalajara, 119,468 (18.04); Puebla, 96,121 (2.78); Monterrey, 78,528 (26.12); San Luis Potosí, 68,022 (11.48); Mérida, 62,447 (43.13); Aguascalientes, 45,198 (29.20); Morelia, 40,042 (7.41); Chihuahua, 39,706 (30.59); Pachuca, 39,009 (4.06); Oaxaca, 38,011 (8.45); Guanajuato, 35,682 (13.99); Saltillo, 35,414 (47.58).

PRODUCTION AND COMMERCE. Mexico is exceptionally rich in minerals, especially silver and gold; there are mines of copper, lead, antimony, zinc, etc., and great petroleum wells. The country is capable of extensive agricultural development, but, in general, farming methods have remained primitive. Before the civil wars of recent years, the grazing industry had attained a very considerable development. But all industries are now prostrated, and at the end of 1915, according to reports, large numbers of the people were in dire need of food. Under conditions of peace, there are large crops of corn, beans, sugar cane, coffee, tobacco, and (in the south), sisal hemp. In 1910-11 the gold output amounted to 1,196,343 troy ounces, and in 1911-12 1,173,957 ounces; silver, 74,140,890 and 80,205,670. Petroleum output in 1911, 12, 629,319 barrels; in 1912, 15,689,268; estimate for 1913, 26,000,000 barrels. At the end of 1912, there were about 89 companies organized for petroleum production; of these, 55 were American, with an approximate investment of \$19,500,000; 13 British, \$15,000,000; and 21 Mexican, \$500,000. The total value of Mexico's mineral output in 1911-12 was over 209,700,000 pesos. In the 35 years from 1877-78 to 1911-12, the gold output totaled 395,904.7 kilograms, valued at 527,871,760 pesos; the silver output,

49,600,726.5 kilograms, valued at 1,973,394,124 pesos; total value of gold and silver, 2,501,265,884 pesos.

COMMERCE. Commercial statistics are not available later than those given in the *NEW INTERNATIONAL YEAR BOOK* for 1914. For the nine months ended March 31, 1914, imports were valued at 121,462,149 pesos, as compared with 148,370,758 pesos in the corresponding months of the previous year, the decline being 18.14 per cent. Exports during the nine months ended March 31, 1914, amounted to 185,666,105 pesos, as compared with 230,736,754 pesos, the decline being 19.53 per cent. A résumé of the commerce for fiscal years ended June 30 is given below. Classified imports were valued as follows, in thousands of dollars American:

	1910-1911	1911-12	1912-13
Mineral substances	26,015	23,856	23,723
Vegetable substances	19,300	15,643	15,785
Machinery and apparatus ..	12,906	11,692	12,249
Textiles and mfra.	12,230	10,641	12,943
Animal substances	8,717	8,233	9,026
Chemicals and drugs	6,495	6,037	6,309
Cars, vehicles, etc.	4,548	2,300	2,553
Wines, spirits, etc.	3,407	3,372	3,426
Paper and mfra.	2,804	2,560	2,644
Arms and explosives	1,606	2,694	3,869
Miscellaneous	4,819	4,802	5,359
Total	102,937	91,381	97,886

Classified exports, in thousands of dollars American:

	1910-11	1911-12	1912-13
Mineral products	90,003	93,108	94,824
Vegetable products	45,634	41,793	42,971
Animal products	8,401	9,931	9,919
Manufactured products	1,805	3,302	1,673
Miscellaneous	1,034	865	815
Total	146,877	148,995	150,203

Trade by countries, in thousands of dollars American:

	Imports		Exports	
	1911-12	1912-13	1911-12	1912-13
United States	49,213	48,644	112,730	116,018
United Kingdom	10,753	12,950	20,099	15,574
Germany	11,923	12,610	5,158	8,219
France	7,809	9,169	4,165	3,576
Spain	2,950	5,265	1,180	1,091
Belgium	1,640	1,402	3,177	2,576
Italy	975	942	79	47
Austria-Hungary ..	1,045	951	104	4
Total, including other	91,381	97,886	148,995	150,203

COMMUNICATIONS. The length of railway in operation Sept. 30, 1913, was 25,398 kilometers (15,782 miles), as compared with 25,287 kilometers (15,713 miles), on Sept. 30, 1912. Federal telegraph offices in 1913 numbered 492, with 85,047 kilometers of line; other telegraph lines, 8387 kilometers. There were 24 radio-telegraph stations. Post offices (1913), 2911; the postal receipts for the fiscal year 1913 were 11,797,627 pesos, and postal expenditure 14,244,150 pesos.

Four years of revolution and warfare naturally produced very serious damage to the railway system of Mexico, and on the great lines there was much chaos and destruction. During 1915 a total of but 36.50 miles of new first track was built, of which 4.50 miles was on the San Diego and Arizona, extending into Lower

California, from 2.6 miles east of Tecate to the Mexican-United States boundary, and 32 miles in the Tampico and Panuco Valley in Vera Cruz between Tampico and Panuco. The Mexican Railway, with the exception of about 25 miles out of the capital which was operated intermittently by the company for a short time, had passed out of its control after Nov. 18, 1914. Miles of track were torn up, equipment was removed from this line and distributed over other railways, and a vast amount of destruction produced. In August, 1914, General Carranza took possession of the Inter-Oceanic Railway, cutting it off from the Mexican Southern, of which the latter is a leased line. The Mexican Southern, however, has not experienced so much damage to its property. The Vera Cruz Railway, a British undertaking, and the Mexican Northwestern were practically a wreck from end to end.

The National Railway system was in a most deplorable condition as regards its rolling stock, and the Director General of the Constitutionalists, Alberto J. Pani, was authority for the statement that more than 70 per cent of the standard gauge cars had been destroyed, and that less than 16 per cent were available for commercial purposes. Thus, on June 30, 1914, there were in service 15,700 broad gauge cars, while by the first of December, 1915, 4675 remained. The railway facilities were merely sufficient to transport the necessities of life and prevent starvation, and carry those whose interests compelled them to travel, as commercial freight was not moving and passenger travel was only undertaken where absolutely necessary. Had railway conditions in Mexico been normal during the year, much of the transcontinental business resulting from the closing of the Panama Canal could have been handled across the Isthmus of Tehuantepec. In Vera Cruz the warehouses were filled to overflowing, and after the recognition of the government increased cargoes were being transported from the United States. The destruction of most of the railway property along this system occurred in the years 1914 and 1915. Hardly a station remained between Monterey and Mexico City that had not been burned. This curtailment of railway transportation and facilities naturally left cities isolated, and had a disastrous effect on mines, mills, and factories, as well as agriculture, because it was impossible to ship supplies in or bring produce out. The plan of the Carranza government for the restoration of railway service was to purchase enough passenger cars to reestablish the former service between Laredo and Mexico City, and also to purchase freight cars, rails, and other material. The shops were being opened up as fast as the Constitutionalist government could get control of them. The law which gave the government the right to take over the railroads in war-time required that they be returned to the company in operating condition, and that an indemnity be paid depending on the earnings of the previous five years, with 10 per cent additional. With the destruction of the railways, their rolling stock and buildings, it will be seen how serious a matter it will be for the government to turn back these railways to their owners in operating condition.

Reports at the end of the year 1915 indicated that, notwithstanding the revolution, the damage to track, buildings, and equipment (on the line connecting the City of Mexico with the At-

lantic port of Vera Cruz) was not such as to keep the railways out of service for long continued periods. Naturally, track was destroyed, buildings were burned, as well as decks of unimportant bridges, while engines and cars were wrecked by running them wild down mountain grades, etc. This naturally involved heavy outlay for repairs, but more important bridges were saved, and the Soledad Bridge, 27 miles from Vera Cruz, which carries both the railway and the highway across the Jamapa River, remained intact, although it undoubtedly would have been destroyed had the American forces advanced from Vera Cruz at the time of the occupation in 1914.

FINANCE. The monetary unit is the peso, with a par value of 49.846 cents. With the disappearance of a generally recognized government in Mexico, metallic currency was practically withdrawn from circulation; enormous quantities of paper money were issued. In September, 1915, the paper peso fluctuated in value between 6 and 8 cents in Mexico City, while in other places it sank as low as 2 cents. It is impossible to set forth the state of Federal finances in 1915. The budget for the fiscal year 1915 placed the revenue at 145,957,000 pesos silver, and the expenditure at 152,204,898 pesos silver. In the fiscal year 1912, the revenue was 105,203,087 pesos, and the ordinary expenditure 96,985,953 pesos. The principal estimated receipts, according to the 1914-15 budget were: customs, 57,875,000 pesos; taxes on real property, 57,761,000; special taxes, 14,432,000; posts and telegraphs, 7,400,000; lottery, 1,200,000. The larger estimated disbursements were, by departments: war and marine, 55,165,428 pesos; finance (including interest on the public debt), 41,178,776; interior, 19,688,956; communications, 14,758,024.

The outstanding foreign debt, as reported for Dec. 31, 1914, was £36,877,398 (including the Mexico City loan).

GOVERNMENT. Under the constitution, Mexico is a federation of states autonomous in local affairs. The legislative power is vested in a congress of two houses, the Senate and the Chamber of Deputies. The senators, 56 in number, are elected, two from each state, by popular vote for four years. The deputies, numbering 233, are elected by popular vote for two years. A constitutional president and vice-president are chosen by indirect vote for six years. The states have their own elective governors, legislatures, and judicial officers. In 1915 anarchy rather than government prevailed in Mexico. In October, 1915, the American government recognized Gen. Venustiano Carranza as chief executive of the *de facto* Mexican government.

HISTORY

THE RIVAL FACTIONS. At the beginning of the year 1915 the pacification of Mexico seemed to have been indefinitely postponed. Victoriano Huerta, to be sure, had been eliminated from the situation, and the Constitutionals, the professed advocates of democratic government and land reform, had triumphantly taken possession of the capital (see 1914 YEAR BOOK, MEXICO, *History*); but the Constitutionalist leaders, Villa and Carranza, had no sooner defeated the dictator than they fell to quarreling among themselves and inaugurated a new civil war.

Each claimed to be the true champion of the oppressed peons, each denounced the other as a traitor to the people. "First Chief" Carranza, supported by his loyal generals, Obregon, Herrera, Dieguez, Villareal, and Alvaredo, had established himself at Vera Cruz. The rival faction, the "Conventionists," had set up Gen. Eulalio Gutierrez as provisional president in Mexico City; Francisco Villa, the chief military leader of the Conventionists, with the assistance of Generals Angelas and Maytorena, and the notorious guerrilla chieftain, "General" Zapata, was strenuously endeavoring to maintain the dominant position of his party in Mexico City and in the northern states against the determined attacks of Carranza's armies. Meanwhile the civilian population, especially in the regions traversed by the lawless soldiers of either faction, suffered severely from the paralysis of industry and the lack of legal protection. With increasing frequency complaints were received from the foreign residents of Mexico City regarding the scarcity of food and the prevalence of disorder. From the provinces came reports of churches desecrated, of violence done to priests and nuns, of towns plundered, and estates despoiled. The distressing condition of the country was revealed in the appeal which the American consul-general at Monterey sent out through the Red Cross, urging the contribution of food supplies for the starving civilians. Thousands of Mexicans, homeless and helpless, fled from their unhappy country and sought refuge in the United States. Thanks to the activity of the Red Cross Society, much was done to relieve this misery, but in many districts the Constitutionalist and Conventionist "generals," suspicious of foreign interference, hindered or prevented the work of relief. The lamentable situation of the common people may well be held in mind as the social background for the tragic conflict between the rival factions in Mexico.

THE GUTIERREZ GOVERNMENT. The Villa and Zapata delegates to the Aguascalientes conference met in Mexico City on January 1st to appoint a provisional administration. After naming José Ortiz Rodríguez as secretary of government, Rodríguez Gómez as minister of justice, and Manuel Palafox as minister of agriculture, the convention called for a recess until the 12th of the month. On the second meeting the Convention immediately named Gen. Eulalio Gutierrez provisional president to serve until April, 1916. Gutierrez perfected and announced his plans for the pacification of Mexico. His plans, however, never came to fruition, for the Convention, notwithstanding its former action, unseated him on the 17th of January and appointed Gen. Roque Garza provisional president. This case illustrates vividly the uncertainty of affairs in the southern republic. An individual might be president one day and a fugitive the next day. Gutierrez added to the complications of the situation by organizing a third national party. With 5000 troops he established his headquarters at Pachuca. He bitterly denounced Villa and Zapata and even appealed to Carranza for aid.

FIGHTING IN NORTHERN MEXICO. Fighting in Northern Mexico, which began early in the year, lasted throughout the entire twelve months, and resulted in the capture of a majority of the Villa strongholds and a weakening of the influence of the bandit chieftain. So fierce were the conflicts and so lawless was the soldiery, that

the country was left in a pitiable condition. In the cities the merchants were robbed of their wares or were taxed to the full amount of their profits. Enormous sums of cash were taken by force or levy from the non-combatants and all provisions were confiscated. In the country districts ranches were stripped of provisions, implements, and cattle, leaving the farmers in a destitute condition. In the middle of January the Conventionists under General Angelas captured Monterey, ending in some measure the terrific fighting which had been going on around the city for more than two weeks. Border towns in the United States suffered greatly from the effects of the fighting across the line. Shots, aimed at the opposing force, but going wild, were constantly falling in some of these border villages. The United States forces, stationed on the American side, were powerless to prevent this kind of fighting. The only possible course of action was to obtain the neutralization of the border line. This, General Scott, in command of the American forces, attempted to do. Both Carranza and Villa were willing to neutralize the border, but General Maytorena, the leader of the Villista force in Northern Mexico, refused to agree to such action. Villa thereupon attempted to replace Maytorena with Gen. Juan Cabral, but the latter disappeared shortly after he was sent to the border line. It was not until February that Cabral was located in Arizona, having escaped from captivity in which he had been held by Maytorena. The neutralization pact was signed by the Constitutionals and the Conventionists on January 10th, but on February 20th a coalition force of the troops of Cabral and Maytorena occupied Naco, contrary to the terms of the agreement. Again in June the pact was violated when General Calles, leading the Carranza forces, captured the same city. Later he advanced on Nogales, but abandoned the attack when the American government entered a strong protest with Carranza.

THE RISE AND FALL OF VILLA'S POWER. Defeats at Amazoc and Puebla, southeast of Mexico City, and at San Lorenzo, northeast of the capital, made it necessary for Villa to evacuate Mexico City hurriedly, and on the 26th of January the Conventionist forces retreated northward from the capital. The bandit chieftain was not beaten, however, by any means. Early in February he encountered the forces of Gutierrez and Carranza in separate battles at San Luis Potosí and won decisive victories. At the same time he proclaimed himself "at the head of the presidency." In the vicinity of Monterey, one of the strongholds of the Conventionists, Villa again encountered Carranza, forcing him to flee southward. General Gonzales announced that he expected to make an attack on Monterey, and, though the attack actually was begun shortly afterwards, the city was not captured until near the end of May. Villa next moved to the western part of the country, where on February 13th he captured Guadalajara, the second most important city of Mexico, forcing General Dieguez with 10,000 Constitutionals to flee. Early in March the Conventionists recaptured Mexico City from Obregon. Villa was now at the height of his power in Mexico. He held Monterey, Torreon, Guadalajara, and Mexico City, and Northern Mexico was almost unanimously sympathetic with the cause of the Conventionists. On March 24th Villa renounced all claims to the presidency

and named Garza the provisional president. A coalition cabinet, acceptable to Villa, Zapata, and Garza, was formed, as follows: Foreign relations, Diaz Lombardo; interior, Francisco Lagos Chazaro; treasury, Francisco Escudero; justice, Manuel Mendez Lopez; communications, Luis Garza Cardenas; public instruction, Valentine Gama; public works, Otillo Montano; agriculture, Manuel Palafox; war, Gen. Francisco Pacheco. During the month of April Villa's power declined. He made several desperate efforts to crush Carranza and Obregon, but accomplished little. Terrific fighting was carried on at Celaya, Tampico, Nuevo Laredo, and in the district surrounding Vera Cruz. In three disastrous attempts to capture Celaya from General Obregon, Villa lost in killed and wounded more than 20,000 men. After this setback he retreated to Aguascalientes. The fighting at Tampico had practically isolated the city, and the people were on the verge of starvation. Foreign merchants found it necessary to loan a sum of money to the city in order that provisions might be bought for the starving inhabitants. During May, Villa won victories at Chica, Querétaro, Panuca, and Silao, but lost Monterey and battles at Paredon and Trinidad Station. During the summer months Villa remained inactive with the exception of several indecisive battles which he fought around Torreon.

MEXICO CITY AND THE CIVIL WAR. No other city played so significant a rôle in the conflict between the rival factions as the federal capital, Mexico City. The moral effect of being in possession of the capital served as a continuous incentive for the contending armies. During the year the Conventionists and the Constitutionalists each held the capital for three periods, ranging from several days to five months in length. At the beginning of the year, as above stated, the capital was in the possession of the Villista forces. The victories of General Obregon, however, at Puebla, Amazoc, and San Lorenzo, compelled the Conventionists at the end of January to withdraw to safer quarters, leaving Provisional President Garza to face the enemy alone or withdraw as best he could. Garza chose the latter course and on the 28th of January General Obregon entered the capital city. Late in February Obregon evoked a protest from the United States government by levying a heavy tax on the foreigners in Mexico City. Notwithstanding the protests of Obregon, Carranza removed the tax on Americans. Obregon gave vent to his wrath, it was reported, by inciting riots against foreigners. There were at the time some 2000 Spaniards, 250 Americans, and a large number of British, French, and Italian subjects within the capital. Shops owned by foreigners, particularly the Spanish, were pillaged and no redress could be obtained. Spain and Great Britain, through the United States, both protested against these indignities. Obregon thereupon threatened to evacuate the city and leave the foreigners at the mercy of the rioters. Food was running scarce and communication with the outside world was almost impossible. Finally, early in March, Obregon was compelled to evacuate the city, and General Zapata marched in with the Conventionist forces. The latter, however, also were incensed against foreigners, and in the course of some rioting murdered an American citizen, J. B. McManus, who

was residing in the capital. An especially strong protest from the United States, through the Brazilian ambassador, Señor Cardoso, elicited an apology for the outrage, as well as the payment of \$20,000 to the widow of McManus. This was the first time during the progress of the revolution that any foreign government had been able to secure reparation for insults or injuries to its subjects. The occupation of the capital by the Conventionists by no means caused a cessation of the rioting and anti-foreign outbreaks which had been in progress. The danger to which foreigners were subjected still was so great that the United States government in April endeavored to obtain the neutralization of the city. Carranza refused the offer on the ground that Mexico City was the objective point of his entire campaign, and that to neutralize the city would be to give the other side a decided advantage. Early in May fresh riots broke out and an attempt was made to assassinate Provisional President Garza, who had been renamed president on March 24th by Villa. Food and other provisions were becoming scarce, and a crisis appeared to be at hand. By June the city was almost completely isolated, foreigners and natives were actually suffering from a lack of food, and no one's life was safe either on the streets or in the homes.

FOREIGN COMPLICATIONS. The disregard shown by the warring factions for the lives and property of foreigners in Mexico repeatedly threatened to precipitate foreign intervention. In January, to cite one of the most conspicuous instances, the Tehuantepec railway tunnel was blown up and bridges destroyed. As the railway was owned by the Cowdray interests and managed jointly by the British firm of Pearson & Son, Ltd., and the Mexican government, the British ambassador, Sir Cecil Spring-Rice, was constrained to inform the United States government that Great Britain viewed the destruction of British property in Mexico with grave concern. Only a few days after the destruction of the railway tunnel, an additional cause for alarm was given by the action of General Carranza in annulling all land grants authorized since 1876, and forbidding the further exploitation of mineral resources in such lands. The Governments of the United States and Great Britain, fearing that the First Chief intended to maintain a ruinous embargo on the exportation of oil from Vera Cruz and to confiscate the foreign-owned oil-wells, protested so vigorously that the Constitutionalist leader consented to respect the legitimate interests of foreign capitalists in Mexican oil-wells. In February, Carranza threatened to incur the hostility of Spain by forcing Señor José Cara, the Spanish minister to Mexico, to leave the country. At the same time, Carranza invited all foreign diplomats to remove from Mexico City to Vera Cruz. The dispute with Spain was adjusted satisfactorily in March, when the Spanish government accepted Carranza's explanation of the dismissal of Señor Cara. A fresh crisis was caused by the attempt of Carranza's lieutenant, General Obregon, to exact cash contributions from foreigners domiciled in Mexico City. Protests were immediately registered at Washington by Sir Cecil Spring-Rice, British ambassador, and Señor Juan Riano, Spanish ambassador. Carranza was finally induced to overrule General Obregon and rescind the tax. Later the Constitutionalist leader is-

sued an order closing the port of Progreso and detaining two American ships. This time the United States, instead of merely protesting, sent two warships to Progreso, causing Carranza to revoke his closure order. Further difficulties resulted from the plundering of Spanish shops in Mexico City, and the precarious situation of foreigners resident in the capital; Great Britain, Brazil, and Italy, as well as Spain, expressed to the State Department at Washington their anxiety in behalf of their citizens. Even the Turkish government was concerned, and demanded an investigation of the execution of two Syrians, Salamon Nigri and Rafael Tereze, by General Villa. Carranza's troops, furthermore, were accused of killing several German and Japanese citizens during the year. In consequence of the chaotic condition of Mexico, it was almost impossible to fix responsibility for the indignities suffered by foreigners, or even to investigate the outrages which guerrilla chieftains were alleged to have perpetrated.

PRESIDENT WILSON'S ATTITUDE. Taking cognizance of the disastrous results of the Constitutionalist revolution, President Wilson, on June 2nd, issued a remarkable statement or declaration of policy, copies of which were sent to Carranza, Villa, Zapata, and Garza:

"For more than two years revolutionary conditions have existed in Mexico. The purpose of the revolution was to rid Mexico of men who ignored the constitution of the republic and used their power in contempt of the right of its people, and with these purposes the United States instinctively and generously sympathized. But the leaders of the revolution, in the very hour of their success, have disagreed and turned their arms against one another.

"All professing the same objects, they are, nevertheless, unable or unwilling to cooperate. A central authority at Mexico City is no sooner set up than it is undermined and its authority defied by those who were expected to support it.

"Mexico is apparently no nearer a solution of her tragical troubles than she was when the revolution was first kindled. And she has been swept by civil war as if by fire. Her crops are destroyed, her fields lie unseeded, her work cattle are confiscated for the use of the armed factions, her people flee to the mountains to escape being drawn into unavailing bloodshed, and no man seems to see or lead the way to peace and settled order.

"There is no proper protection, either for her citizens or for the citizens of other nations, resident and at work within her territory. Mexico is starving and without a government.

"In these circumstances the people and government of the United States cannot stand indifferently by and do nothing to save their neighbor. They want nothing for themselves in Mexico. Least of all do they desire to settle her affairs for her, or claim any right to do so. But neither do they wish to see utter ruin come upon her, and they deem it their duty as friends and neighbors to lend any aid they properly can to any instrumentality which promises to be effective in bringing about a settlement which will embody the real objects of the revolution—constitutional government and the rights of the people."

THE SITUATION IN JUNE. The immediate effect of President Wilson's declaration was not to conciliate, but rather to stimulate the rival Mexican factions to renewed military activity, be-

cause the President's concluding sentence seemed to imply that if either party could win a decisive victory, it would receive aid from the United States in "bringing about a settlement" in the interests of "the real objects of the revolution." At the time President Wilson's declaration was issued, the contest between Villa and Zapata on the one hand and Carranza and Obregon on the other seemed to have reached a deadlock. Villa, it will be recalled, had been defeated at Celaya in April and had withdrawn to Aguascalientes. In May he had engaged in a protracted struggle with General Obregon, and at last claimed a victory (at Silao), May 22nd. Carranza, however, had consistently denied reports of Villa's victories, and had announced victories for his own forces at Monterey, Paredon, and Guanajuato. About June 1st, it was estimated, the forces at the disposal of Carranza, including General Obregon's army of about 20,000 men near Leon, Gen. Pablo Gonzales's army of 15,000 at Puebla, and other scattered forces, aggregated over 50,000 men. General Villa, in the vicinity of Aguascalientes, commanded almost 40,000 men, while Zapata, operating around Mexico City, had about a fourth as many troops. In Sonora warlike bands of Yaqui Indians were terrorizing the populace. Nor must the "army" of 3000 men be forgotten, with which ex-Provisional President Gutierrez, in the state of San Luis Potosi, maintained his forlorn hope. Events moved rapidly the first week in June, following the publication of the Wilson declaration. Villa having captured Silao, struck at General Obregon's forces, which had been slowly advancing northwards. The blow failed, and Obregon's advance continued irresistibly, forcing Villa to retreat northwards in the direction of Zacatecas and Torreon. Meanwhile the situation of the Zapata-Villa forces in Mexico City became critical. In the face of impending disaster, the Conventionists in Mexico City deposed Provisional President Roque Gonzales Garza, and elected as his successor Lagoz Chazaro, one of Villa's followers, who had been Governor of Vera Cruz under the presidency of Madero. Both Chazaro and Villa replied to President Wilson's declaration, Chazaro by threatening to resist foreign interference, Villa by denying the necessity for intervention. Carranza emphatically refused to accept any programme of conciliation involving compromise with Villa; the pacification of Mexico, he declared, could be achieved only by the complete victory of the Constitutionalists. Accordingly, he ordered Gen. Pablo Gonzales to push his campaign against Mexico City with the utmost vigor, in order that a military decision might be reached. Four members of Carranza's cabinet refusing to support the First Chief in his unyielding attitude, tendered their resignations—Rafael Zubaran, minister of the interior; Luis Cabrera, minister of finance; Jesus Urueta, minister of foreign affairs; and Escudero Verdugo, minister of justice. Meanwhile the lawless activities of the Yaqui Indians in the State of Sonora had become so intolerable that the United States government decided to send a small landing party to protect American lives and property on the western coast of Mexico. The situation was still further complicated by a dispute between Villa and the British government over the killing of four British subjects at Tuxpam; reparation was sternly demanded by Great Britain, and British subjects were warned

by Sir Edward Grey, June 21st, that it was unsafe to visit Mexico. From Mexico City came reports that riots were frequent, that shops were being plundered, that a hundred thousand persons were suffering from lack of food. To cap the climax, Victoriano Huerta, the former dictator, appeared in New Mexico, with the intention, it seemed, of inaugurating a counter-revolution (cf. *infra*). It was under these circumstances that the United States government, despairing of the ability or intention of the Mexican revolutionists to restore law and order in their unhappy country, on June 30th invited the ambassadors and ministers of Argentina, Brazil, Chile, Bolivia, Guatemala, and Uruguay to participate in a conference for the discussion of the Mexican problem. The results of the meeting of this conference in August are discussed in a subsequent paragraph.

THE CONTEST FOR MEXICO CITY IN JULY. During the month of July, in the interval between the invitation for the Pan-American Conference and the meeting of the Conference, interest centred in the contest for possession of Mexico City. General Gonzales's attack on the city in the latter part of June forced the Zapata-Villa army to evacuate the city, and General Gonzales triumphantly took possession of the capital, July 10th, in the name of Carranza. Zapata, however, speedily succeeded in cutting off the water supply of the city, while Villa dispatched an army to capture Querétaro and Pachuca, menacing the communications of the Constitutional army. Gonzales therefore prudently withdrew from Mexico City, July 19th, and Zapata again became master of the city. The isolation of the city from the outside world caused intense misery. The scarcity of food became alarming. Urgently the United States government demanded that the Constitutionalists permit food to be sent to relieve the starving population of Mexico City. In response to the State Department's protests, General Carranza ordered Gonzales to attack Mexico City once more. The attack succeeded, and General Gonzales occupied the city; but complaints regarding conditions in Mexico City continued to appear in the press.

THE PAN-AMERICAN CONFERENCE. On August 5th the representatives of Argentina, Brazil, Chile, Bolivia, Uruguay, Guatemala, and the United States met in consultation at Washington to decide upon the course to be pursued in relation to the warring Mexican factions. The conference immediately resolved to send an appeal, August 11th, to the leaders of the rival parties, in order to bring an end to the civil war and establish a provisional government. The text of the appeal follows:

"The undersigned, the Secretary of State of the United States, and Ambassadors Extraordinary and Plenipotentiary of Brazil, Chile, and Argentina, and the Envoys Extraordinary and Ministers Plenipotentiary of Bolivia, Uruguay, and Guatemala, accredited to the Government of the United States of America, acting severally and independently, unanimously send to you the following communication:

"Inspired by the most sincere spirit of American fraternity, and convinced that they rightly interpret the earnest wish of the entire continent, they have met informally at the suggestion of the Secretary of State of the United States to consider the Mexican situation and to ascertain whether their friendly and disinterested

help could be successfully employed to reestablish peace and constitutional order in our sister republic.

"In the heat of the frightful struggle which for so long has steeped in blood the Mexican soil, doubtless all may well have lost sight of the dissolving effects of the strife upon the most vital conditions of the national existence, not only upon the life and liberty of the inhabitants, but on the prestige and security of the country. We cannot doubt, however—no one can doubt—that in the presence of a sympathetic appeal from their brothers of America, recalling to them these disastrous effects, asking them to save their motherland from an abyss—no one can doubt, we repeat—that the patriotism of men who lead or aid in any way the bloody strife will not remain unmoved; no one can doubt that each and every one of them, measuring in his own conscience his share in the responsibilities of past misfortune and looking forward to his share in the glory of the pacification and reconstruction of the country, will respond, nobly and resolutely, to this friendly appeal and give their best efforts to opening the way to some saving action.

"We, the undersigned, believe that if the men directing the armed movement in Mexico—should agree to meet, either in person or by delegates, far from the sound of cannon, and with no other inspiration save the thought of their afflicted land, there to exchange ideas and to determine the fate of the country—from such action would undoubtedly result the strong and unyielding agreement requisite to the creation of a provisional government, which should adopt the first steps necessary to the constitutional reconstruction of the country—and to issue the first and most essential of them all, the immediate call to general elections.

"An adequate place within the Mexican frontiers, which for the purpose might be neutralized, should serve as the seat of the conference, and in order to bring about a conference of this nature the undersigned, or any of them, will willingly, upon invitation, act as intermediaries to arrange the time, place, and other details of such conference, if this action can in any way aid the Mexican people.

"The undersigned expect a reply to this communication within a reasonable time, and consider that such a time would be 10 days after the communication is delivered, subject to proration for cause."

Villa readily accepted this offer of the powers to meet in a peace conference. Carranza delayed answering the report by making inquiry as to whether the signatories of the document were the accredited representatives of their respective governments. The subordinates of the Constitutionalist leader, however, rejected the offer without further consideration and expressed resentment at the interference of the Pan-American powers. On September 3rd Carranza was informed that the signatories to the document were official. One week later it was officially announced from Constitutionalist headquarters that the chieftain had rejected the offer. Carranza, it was said, could not consent "that the interior affairs of the republic be handled by mediation or by the initiative of any foreign government." Instead he suggested a border conference at which the international aspect of the Mexican situation could be discussed. The

Pan-American Conference, however, did not favor going to Mexico or Texas to meet the Mexican leaders.

RECOGNITION OF CARRANZA. The Conference met in New York City on September 18th, and after deliberation decided that recognition should be given to the Mexican faction which possessed "the material and moral capacity necessary to protect the lives and property of natives and foreigners." Three weeks later, on October 9th, the representatives of the seven nations met again to decide which faction should be recognized. The unanimous choice was for Carranza and the Constitutionalist. Each of the seven governments accepted the decision of the Conference. Before granting recognition to the Constitutionalist leader, who had been fighting for two and a half years against Huerta and Villa, the Conference secured certain promises from him. These promises were (1) that the lives and property of foreigners and natives in Mexico should be protected; (2) that members of religious orders be permitted to return and be secure in life and property on condition that they did not enter politics; (3) that general amnesty be granted to Mexicans, excepting the real leaders of the opposing factions; (4) that the *de facto* government take steps to restore law and order, to provide for general elections, and the restoration of the Constitutionalist order in Mexico.

Carranza expressed appreciation of the action of the Conference, and agreed to send diplomatic agents to each of the countries. Nicaragua and Colombia joined with the other seven nations on October 18th officially in recognizing Carranza as the Chief Executive of the Republic of Mexico. Each of the countries prepared to send a representative to Mexico, while in the United States President Wilson ordered an embargo on all shipments of arms from this country to Mexico, except those consigned to the Carranza government. It was hoped that the recognition of Carranza would end the long conflict which had been in progress in Mexico. It was felt that Carranza, while not an ideal President, was, nevertheless, the most powerful man in Mexico and should be able, therefore, to restore order in the turbulent republic.

THE DEFEAT OF VILLA. In consequence of the moral advantage of recognition as *de facto* Chief of the Mexican government, and thanks also to the material advantage given him by President Wilson's embargo on the export of arms to other Mexican factions, Carranza was able to make rapid progress in the subjugation of the Conventionists, who stubbornly refused to accept the decision of the Pan-American Conference. On November 8th 200 of Zapata's officers laid down their arms. Gutierrez, the former Provisional President, likewise surrendered. Chazaro was killed. Villa, however, determined to fight to the end, and defied both the United States and the Carranza government. In November Villa laid siege to Agua Prieta, across the border from Douglass, Arizona. He was forced to abandon the siege in order to protect himself against the two Constitutionalist armies which now advanced against him, one from the direction of Hermosillo, the other from Torreon. In December Villa's forces in Sonora were defeated and driven westward into Chihuahua, where they continued to resist the Constitutionalist. Although it was reported, December 21st, that rep-

representatives of Villa and of Carranza had agreed on peace terms, stipulating for amnesty for Villa's adherents, and although certain of Villa's lieutenants undoubtedly accepted Carranza's terms, the rebel leader himself still remained in the field, with a pitifully small and rapidly dwindling force. Meanwhile Carranza had received recognition from Great Britain and other Powers in addition to the seven American governments which had taken the initiative in the matter. An interesting dispatch at the very close of the year indicated that the newly recognized Provisional President had annulled all concessions and contracts made by the Huerta and Conventionist régimes.

ALLEGED RELIGIOUS PERSECUTION. Although Carranza had promised to establish and maintain religious liberty in Mexico, complaints were persistently made throughout the year 1915 that the Constitutionalists in various localities were conducting a bitter campaign against the Catholic Church. Mr. Joseph Tumulty, secretary to President Wilson, denied the oft-repeated allegation that the Constitutionalists had been guilty of assaults upon nuns. The American Federation of Catholic Societies, however, made public a declaration that affidavits had been submitted to the United States government, proving that religious women in Mexican convents had been outraged by the lawless Constitutionalists. In regard to the confiscation of church property little doubt seemed to exist. It was furthermore alleged that in certain districts, in Yucatan and Morelos for example, decrees had been issued by Constitutional authorities, prohibiting or restricting the free exercise of the Catholic religion.

DEATH OF DIAZ. One chapter of Mexican history was closed definitely on July 2nd, when Porfirio Diaz, the famous ex-dictator of Mexico, died at Paris.

IMPRISONMENT OF HUERTA. At the end of March, Victoriano Huerta, who had been living in retirement in Spain, took passage for New York. In spite of the protests of Villa and Zapata, the United States government allowed the ex-dictator to enter the country, on condition that he would renounce all intention of entering Mexico or Cuba. In June, however, General Huerta was discovered in New Mexico, in company with General Orozco. Both were arrested on the charge of violating American neutrality by conspiring on American soil to start a new revolt in Mexico. Bail was furnished for both prisoners, but Orozco shortly escaped into Mexico, and Huerta was again arrested and imprisoned. Orozco was later killed at the head of a raiding party.

See also *UNITED STATES, History.*

MEZIERES, ALFRED JEAN. French scholar and writer, died Oct. 12, 1915. He was born in Rehon in 1826, and was educated in Metz and Paris. From 1881 to 1900 he was a member of the Chamber of Deputies. He was the author of many notable works on literature, and was at the time of his death the oldest living member of the French Academy. See also *ACADEMY, FRENCH.*

MIAMI UNIVERSITY. An institution for higher education founded at Oxford, Ohio, in 1809. There were enrolled in the autumn of 1915, 771 students, and there were in the faculty 47 professors, associate professors, and assistant professors, and 8 instructors. The uni-

versity received during the year a bequest of about \$425,000 from Mrs. Whaling, of which \$250,000 was for a men's dormitory and \$175,000 for endowment. The library contains about 45,000 volumes.

MICHIGAN. POPULATION. The estimated population of the State on July 31, 1915, was 3,015,442. The population in 1910 was 2,810,173.

AGRICULTURE. The acreage, production, and value of the principal crops estimated by the United States Department of Agriculture in 1914-15 were as follows:

		Acreage	Prod. Bu.	Value
Corn	1915	1,750,000	56,000,000	\$38,080,000
	1914	1,750,000	63,000,000	42,210,000
Wheat	1915	960,000	20,448,000	20,652,000
	1914	879,000	17,816,000	17,835,000
Oats	1915	1,530,000	64,260,000	22,491,000
	1914	1,515,000	50,752,000	22,838,000
Rye	1915	390,000	6,045,000	5,138,000
	1914	371,000	5,936,000	5,402,000
Barley	1915	85,000	2,508,000	1,555,000
	1914	90,000	2,340,000	1,521,000
Potatoes	1915	355,000	20,945,000	11,729,000
	1914	364,000	44,044,000	18,213,000
Hay	1915	2,470,000	3,458,000	42,188,000
	1914	2,352,000	3,011,000	36,132,000
a Tons.				

LIVE STOCK. The United States Department of Agriculture estimated that on Jan. 1, 1916, and Jan. 1, 1915, horses numbered 680,000 and 673,000 valued at \$87,640,000 and \$88,836,000, mules numbered 4000 and 4000 valued at \$532,000 and \$524,000, milch cows numbered 847,000 and 814,000 valued at \$47,601,000 and \$49,247,000, other cattle numbered 735,000 and 707,000 valued at \$20,066,000 and \$21,069,000, sheep numbered 1,931,000 and 2,033,000 valued at \$11,007,000 and \$10,165,000, swine numbered 1,462,000 and 1,392,000 valued at \$13,158,000 and \$15,173,000. The production of wool in 1915 and 1914 was 8,098,000 and 8,073,000 pounds respectively.

MINERAL PRODUCTION. The production of the refined copper in the State was 158,009,748 pounds, compared with 155,715,286 pounds in 1913. The reduced production resulted, in 1913, from the strike of miners which continued throughout the latter part of the year and continued up until April 12, 1914. Michigan ranks second in the total production of this mineral. At the close of 1914 there had been produced 5,519,442,640 pounds. The total production of copper in that year amounted to 164,344,058 pounds, valued at \$21,857,759, as compared with 135,853,409 pounds, valued at \$21,057,278. The coal production in the State in 1914 was 1,283,030 short tons, valued at \$2,559,786, compared with 1,231,786 tons, valued at \$2,455,227 in 1913. The coal production has exceeded 2,000,000 tons in one year only, 1907. It then decreased steadily until 1912, since when it has shown a slight increase. Michigan ranks second in the production of iron ore. There were produced in 1914, 8,533,280 tons, compared with a production of 12,668,560 in 1913. The marketed value of the output of 1914 was \$18,722,358, compared with a value of \$33,479,954 in 1913. The total value of all mineral products in 1914 was \$57,732,447, compared with \$72,143,211 in 1913.

TRANSPORTATION. The mileage of single track railway on June 30, 1914, was 8898. There was practically no railway construction in 1915.

FINANCE. The report of the State treasurer

for the fiscal year ended June 30, 1915, shows a balance on hand July 1, 1914, of \$10,171,285. The total receipts for the year were \$15,940,956 and the disbursements, \$16,536,166, leaving a balance, June 30, 1915, of \$9,576,075.

EDUCATION. The latest statistics available for education in the State are for Jan. 30, 1914. On that date the total school population was 826,409, with a total enrollment in the public schools of 581,351. The total number of teachers was 19,734. The average monthly salary of men teachers was \$91.27, and of women teachers, \$55.71. There were expended in teachers' wages, \$10,275,281.

CHARITIES AND CORRECTIONS. The charitable and correctional institutions include Kalamazoo State Hospital, Pontiac State Hospital, Traverse City State Hospital, Newberry State Hospital, Ionia State Hospital, the Michigan Home for the Feeble-minded and Epileptic at Lapeer, the State prisons at Jackson and Lansing, the Michigan Reformatory at Ionia, the Industrial School for Boys at Lansing, the State Industrial School for Girls at Adrian, the State Public School at Coldwater, the Michigan School for the Deaf at Flint, the Michigan School for the Blind at Lansing, the Michigan Employment Institution for the Blind at Saginaw, the Michigan Soldiers' Home at Grand Rapids, the State Sanatorium at Howell, an additional State Sanatorium for the care and treatment of persons afflicted with tuberculosis, and a farm colony for the care and treatment of epileptics. There are also under the care of the State board juvenile courts, county agents for the care of the poor, maternity hospitals, and child caring and placing agencies.

POLITICS AND GOVERNMENT. Gov. Woodbridge N. Ferris was inaugurated for a second term on January 7th. In his message he urged the adoption of a short ballot, and the submission of a constitutional amendment making all State officers, except Governor and Lieutenant-Governor, appointees of the Governor. He also recommended the elimination of circuit court commissioners and coroners, and suggested that the work of these officials be done by justices of the peace. On April 5th a local option election was held in the counties of the State. No-license advocates were successful in 14 counties, and license advocates in 2.

STATE GOVERNMENT. Governor, Woodbridge N. Ferris; Lieutenant-Governor, Luren D. Dickinson; Secretary of State, Coleman C. Vaughn; State Treasurer, John N. Harrer; Auditor-General, Aramel B. Fuller; Attorney-General, Grant Felbours; Superintendent of Public Instruction, Fred L. Keller.

JUDICIARY. Supreme Court: Chief Justice, John W. Stone; Justices, Flavius L. Brooke, Franz C. Kuhn, Russell C. Ostrander, John E. Bird, Joseph B. Moore, Joseph H. Steere, Rollin H. Person; Clerk, Charles C. Hopkins.

STATE LEGISLATURE:

	<i>Senate</i>	<i>House</i>	<i>Joint Ballot</i>
Republicans	29	95	124
Democrats	3	5	8
Republican majority..	26	90	116

MICHIGAN, UNIVERSITY OF. A State institution for higher education founded at Ann Arbor, Mich., in 1837. The total enrollment in all departments at the end of the year 1915,

was 5821. In addition there were 868 registered in the summer school and 350 in the extension courses, making the total enrollment on Nov. 1, 1915, 7034. The total number of officers and instructors was 565. There were several important changes in the faculty during the year. There were lost by death Professors Guthe, D'Ooge, and Walker. The university received during the year gifts of two residence halls for women, of the total value of about \$550,000. There was completed during the year 1915 a large and thoroughly modern building for the natural sciences, this building costing somewhat more than \$400,000. The legislature of 1915 gave to the university an appropriation of \$30,000 for a new library building. The productive funds at the end of the last fiscal year were \$963,193. Of this sum \$546,579 were proceeds of the sale of federal land grants, which are held by the State, and on which it pays interest of 7 per cent per annum. The annual income was \$2,535,260, including a balance at the beginning of the year of \$196,769. The library, on June 30, 1915, contained 352,718 volumes.

MICROPHONE. An ingenious use of telephone microphones was made by the French armies for detecting the approach of hostile aircraft. A battery of four phonograph horns was mounted on a stand so arranged as to be capable of turning in azimuth, as well as elevated to any angle of altitude desired. The horns connected with a common microphone from which conducting cords were connected with telephone receivers. It was reported that with this device an approaching airship could be heard at a distance of several miles. In the United States, E. F. Chandler invented a method of determining the altitude of airships so as to secure the range for anti-aircraft guns. The same arrangement of horn and microphone was employed, but these were placed at the angles of a symmetrical area the lengths of whose sides were accurately known. When the sound of an unseen aeroplane was loudest, as determined by inclining each receiver independently, the angle of inclination of each microphone was read and a rapid calculation by slide rule gave the altitude desired. Dr. Lee De Forest was experimenting with the same object in view with similar apparatus, but using his audion (see **WIRELESS TELEGRAPHY**) for amplifying the sounds. The methods referred to above were also employed for detecting the approach of submarine vessels.

MILITARISM. See **SOCIALISM**.

MILITARY AERONAUTICS. See **AERONAUTICS**; and **MILITARY PROGRESS**.

MILITARY HYGIENE. See **MILITARY PROGRESS**.

MILITARY PROGRESS. UNITED STATES. General Progress and Preparedness. In the United States, as in its dependencies, a state of peace existed during 1915. This is not to be held to mean that the situation had not from time to time proved critical. Anarchy prevailed in Mexico throughout the year; at its close some improvement manifested itself in Carranza's apparently growing strength. The condition of that unhappy country, carrying as it did its civil war to within close rifle-range of United States territory, made it necessary to continue the patrol of the frontier. At the end of the year, 741 officers and 19,444 men were



Colonel E. A. HUOT and Major-General LEONARD WOOD WATCHING THE DRILL



Photographs by Paul Thompson

EXPLAINING THE RIFLE MECHANISM TO THE MEN
THE BUSINESS MEN'S MILITARY TRAINING CAMP AT PLATTSBURG

on duty on the border or adjacent thereto, a distance of 2000 miles. The discipline of the troops under the most trying circumstances remained excellent. The submarine policy of the central empires caused a serious strain in our relations with those countries; the close of the year saw improvement.

A direct result of the European war, the significant military note in the United States, was the awakening of the American people to a realization of the country's unpreparedness. Both sides of the question were debated. Those who argued against preparedness maintained that any preparation as such meant a plunge into militarism; on the opposite side were found advocates even of compulsory service. Between these extremes stood the advocates of measures, which in President Hibben's happy phrase, would constitute preparedness against war. See also *SWITZERLAND, Army*. There can be no doubt that the interest of the people in this question was genuine: proof may be found in the declarations of the press, of the pulpit, and of college faculties. If further proof were needed, we have but to consider the so-called "business men's" camps (three in number), held during the autumn at Plattsburg, N. Y., Fort Sheridan, Ill., and San Francisco, Cal. Of these, the most conspicuous was the Plattsburg gathering, in which, under the auspices of the regular army, was to be found an unusual personnel. The purpose of all these camps was to give some idea of the seriousness of the military profession, and to show the necessity of preparation and effort. Four "students'" camps were held (see *YEAR BOOK*, 1914).

The awakening of the country translated itself into the proposals of the secretary of war to remedy the situation. In brief, the plan of the secretary called for an increase of the regular army to about 142,000 men by adding 10 regiments of infantry, 4 of field artillery, 52 companies of coast artillery, 15 of engineers, and 4 *aéro* squadrons. It was further proposed to supplement the regular army by a force of 400,000 men raised in increments of a little over 133,000 per year, who should devote a specified time to training for a period of three years, and then be on furlough for another period of three years, without any obligation save that of returning to the colors in case of war or imminency thereof. This force, designated as the continental army, was to be recruited territorially according to population, to serve short periods (two months per year) of intensive training, and to be officered by men developed by its own efforts and by others drawn from the National Guard, from the army and no longer on its active list, and finally by those who had in colleges or schools or otherwise acquired sufficient military information and experience to be available. During the time of actual service pay, etc., should be the same as that of the regular army. As the great need of the United States in case of war would be officers, it was proposed to organize a certain number of cadet companies to be attached to regiments or other units of cavalry, field artillery, infantry, engineers, coast artillery corps, and signal corps. These cadets were to be recruited from the National Guard and from the students and graduates of schools and colleges giving military instruction. Service in

the companies was to be for one year, followed by five years in officers' reserve corps, if qualified therefor. As an alternative proposition, however, it was not impossible that a better system of getting officers would be found in reorganizing the military departments of institutions under the direction of officers of the army, so as to make them in effect officers' training schools. And lastly, it was proposed to commission in the reserve, any other qualified citizens, not only those coming from the National Guard, graduates of military and other institutions, but also civil engineers, railroad men, those engaged in aviation and in motor transportation in general, and to give increased support to the National Guard.

As germane to this subject of a supply of officers, certificates were issued, under the act of Jan. 21, 1903, to 37 persons found to be specially qualified to hold volunteer commissions. In addition, the office of the chief of staff had a list of about 1400 students of civil institutions of learning recommended as qualified, and of 5000 applications for appointments as officers of volunteers.

The plan of the secretary of war just briefly outlined was not the only one suggested. We have to mention that of the general staff, not officially approved up to the end of 1915, and differing in principle from that of the secretary. This looked to a standing army, present with the colors, of about 281,000, with such provisions for a reserve of the regular army as would, in the course of time, provide a home force of 500,000 more men, all of whom would have had regular training under professional officers. Various other measures were proposed in Congress before the year closed.

The Act of March 4, 1915, marked an advance in military penology; the military prisons ceased to exist as such and became disciplinary barracks. Prisoners now receive regular instruction instead of passing, as formerly, all their time at hard labor. The secretary was empowered to grant an honorable restoration to duty, not only to the inmates of the disciplinary barracks, but to all other general prisoners elsewhere confined.

Questions of coast defense, in view of the increase of the offensive and defensive qualities of warships, also increased in importance. To take under cognizance all such questions, a board of review was created by War Department orders, consisting of the chief of staff and assistants, and of the chiefs of coast artillery, of engineers, and of ordnance.

Material Progress. The demands made upon American manufacturers to supply the European belligerents with war materials have greatly increased the manufacturing capacity of the country. Even if, after peace is signed, the new establishments should go out of business, the experience gained would nevertheless be invaluable in case of necessity.

Aéronautics. Congress appropriated only \$300,000 for the development of army *aéronautics*, an insignificant sum. No material progress can therefore be reported. The Canal, the Philippines, and Hawaii, like the United States, were at the end of the year without aerial protection. Plans were communicated by the War Department to the *Aéro Club of America* for the formation of 15 aviation squadrons in the National Guard. The real weakness of the

United States, however, consisted not so much in lack of matériel as of personnel. The manufacturing plants were able at the end of the year to turn out work at the rate of two flying machines per day, and the rate could have been increased. It was nevertheless pointed out by Mr. John Hays Hammond, Jr., that it would take years for the United States to increase its military organization to the point where it could equal the standard of any possible enemy. Here time counts, not money. But an invaluable unit of defense could be organized by applying radio systems to aeroplanes and establishing aero scouting districts along the seaboard. Coöperation could be effected between the navy and the land defenses, so that the latter could be handled to the best advantage.

Coast Artillery. Turrets for installation on El Fraile Island in Manila Bay were under test. Fourteen-inch wire wound guns weighing 70 tons were to be emplaced. At a muzzle velocity of 2360 foot second, the projectile will penetrate 12 inches of the best armor at 15,000 yards. For the proposed forts at Cape Henry, 16-inch wire wound guns were recommended by a committee of the Fortification Board. This gun is 45 calibres long, is to be mounted on a disappearing carriage, and will throw a projectile weighing 2200 pounds. It will be the main type for main batteries of new works. During the year, 5 additional 14-inch, 40 calibre, guns were manufactured. These guns were designed for 1660 pound projectiles, giving at 15° elevation with 2250 foot second muzzle velocity, a maximum range of 18,000 yards. By enlarging the powder chamber, however, the muzzle velocity was raised to 2350 foot second, thus increasing the maximum range to 19,300 yards at 15°. With a 1200 pound projectile, the muzzle velocity could be increased to 2775 foot second, with a maximum range of 21,400 yards.

It was recommended that mobile guns of at least 12-inch calibre, mounted on specially constructed railroad carriages or dragged by suitable motors, were needed to complete the system of coast defense, by protecting undefended harbors, by preventing hostile ships from landing troops out of range of coast forts, and by helping mobile troops to defend the approaches and rear of those forts. The submarine mine matériel was still incomplete at the end of the year.

National Guard batteries to the number of 125 attended camps of instruction, and of these 81 had service practice. The number of officers and men, whether regular or militia, was still short by several thousands, of the total required for the coast defenses of the United States.

The subject of aeronautics in coast defense attracted attention, but did not go beyond this point during the year.

Field Artillery. The Ordnance Department continued its efforts to develop a mobile artillery matériel of greater range and power. A 3.8-inch split trail howitzer gave good results and a number were to be manufactured. Designs of 4.7-inch split trail guns and howitzers were developed, as also of 9.5-inch and 11-inch howitzers. Reports of the 3-inch mountain howitzer showed that it was not entirely satisfactory. A 7.6-inch siege howitzer and carriage were under construction; the projectile, 240 pounds, at 40° elevation, was to have a range of 11,000 yards. The 9.5-inch howitzer, using a

480-pound projectile, was, at the same elevation, to have the same range. An anti-aircraft gun, projectile 6 pounds, with muzzle velocity of 2400 foot second, was developed. A proper type of self-contained horizontal base range-finder having been determined by service tests, orders for manufacture in quantity were given.

The field artillery regulations were under revision by a board of officers. Camps of instruction were held at various points for the instruction and training of National Guard batteries, 125 of which took advantage of the opportunities offered.

Miscellaneous. The Vickers-Maxim light gun was, after competitive test, adopted as the service machine gun. The school of musketry was transferred to Fort Sill, Okla., and opened on August 20th with a capacity of 60 student officers, and 142 student non-commissioned officers.

Much experience was gained in the matter of motor transport. This method of carriage was found trustworthy even on bad roads. The 1.5-ton truck gave the best results for field service. Trailers were not recommended unless roads were good; this condition satisfied, their use was economical. Steady improvement was announced from the remount depots in type, breeding, and appearance of young horses purchased by the War Department, as the result of the remount service. According to reports from a majority of cavalry officers received during the year, the single rank formation is better for our service than the double.

The first aero squadron changed station by flight in November, from Fort Sill, Okla., to Fort Sam Houston, Texas. The supply train accompanied the flight on auto trucks.

The aviation section of the signal corps made four records during the year:

Altitude with passenger. Lieutenant Carberry, with Lieutenant Christie as passenger. American record, 11,680 feet, Jan. 5, 1915; duration, 1 hour, 13 minutes.

Duration. Lieut. B. Q. Jones, Jan. 15, 1915. In air 8 hours, 53 minutes. American record.

Duration with two passengers. Lieut. B. Q. Jones, pilot, with Corporals Hale and Houser, passengers, on March 12, 1915. In air 7 hours, 5 minutes. World's record.

American duration for pilot alone. Lieut. W. R. Taliaferro, Sept. 17, 1915, 9 hours, 48 minutes.

The Heinrich military tractor biplane was developed to meet the signal corps' requirements of high speed, low landing speed, speed variation of more than 50 per cent, climbing power, good gliding angle. The controls are duplicate. A 110-horse-power motor develops a speed of 45-80 miles per hour. The gasoline consumption is 10 gallons per hour, and enough for four hours can be carried. The total lifting area is 285 square feet.

The Cuban army was reorganized on the basis of compulsory service.

EUROPEAN WAR

The interest shown by the American people in the question of preparedness derived its significance and inspiration from the war raging in Europe. To that war we turn for illustrations of all that is novel in armed strife, and also for some return to ancient methods.



A FRENCH SOLDIER EQUIPPED TO WITHSTAND POISONOUS GASES



Photographs by Paul Thompson

GERMAN SOLDIERS USING A MACHINE GUN
THE WAR IN EUROPE

Our remarks and conclusions must be drawn chiefly from the operations on the western front, because in the east and the south the strife still retains what, for lack of a better term, we may call its old-fashioned character.

The year 1914 (see YEAR BOOK, 1914) had left the contestants on that front virtually besieging each other. No change in this regard took place in 1915. But as the year wore on, it became increasingly evident that the struggle was becoming one of resources. To cite only one item, the consumption of ammunition was at a rate unforeseen by any of the contestants, even by Germany. To continue the war at all imposed a demand for material unheard of before. Hence what may be denominated the mobilization of industries, a feature that distinguishes this struggle from any other, and that will certainly be a factor of dominating importance in any future war between powerful rivals. So important is this particular aspect of the question of supply, that the Russian defeats of 1915 have been very largely attributed to the lack of ammunition. It may be laid down as a principle, therefore, that under the modern conditions of a war of masses, success depends upon industrial organization and efficiency. A country cut off from the sea, as is Germany, and not producing within its own borders certain essentials, must face defeat unless it can in advance lay in such a stock of materials as to outlast any possible adversary.

The fact that this war had become a test, as it were, of endurance developed (on the western front) trench warfare to a degree never before conceived. This condition determined the character of the struggle. Troops lived, moved, and had their being in the ground and under the ground. The "line" became in reality a deep area of successive positions, strongly held by enormous numbers of men. Mining and countermining became general. The proximity of the trenches, sometimes only a few yards apart, brought into play ways and means either unheard of before, or that had been abandoned because of new conditions, themselves not reproduced in the actual struggle. Among these may be mentioned the hand grenade (used as long ago as the Siege of Saloniki, 904), knives, and even clubs, for close work. The Germans early introduced their *Minenwerfer*, a trench howitzer throwing a shell 16 inches in diameter, and carrying a bursting charge of 86 pounds of trotyl. This shell was fastened to one end of a rod slipping into the bore (2.1 inches in diameter), and at an angle of projection of 45 degrees attained a range of 1244 feet. The startling novelty of the year, in respect to trench attack, was the use by the Germans of asphyxiating gases, by way of clearing the field for the assault. (See also CHEMISTRY, INDUSTRIAL, *Asphyxiating Gases*.) Apparently these gases were chiefly the fumes of chlorine and of bromine, but traces of others, such as sulphurous anhydride, nitrous acid, etc., were found. Various methods of liberating these gases were employed: pipes from stationary generators, with valves to be opened when the wind was favorable; transportable cylinders carrying the gases under pressure; hand grenades and bombs to be thrown at the right moments; shells fired by the *Minenwerfer*; etc. The effects of the fumes could be felt at a distance of half a mile; to guard against them smoke helmets

and respirators were issued and found to be efficacious. Inflammable liquids also were used (by the Germans), petrol, paraffin, and tar, or a mixture of these. Little was known of their use; they were propelled a distance of 150 feet. The use of both gases and liquids was a violation of Article 23, Hague Declaration of 1899.

Certain other effects or results developed. The presence of the troops in trenches led to a preponderance of head wounds. The French introduced a remedy by the adoption of a steel helmet 0.7 millimeter thick. It unquestionably saved many lives; the British, at the end of the year were beginning to use them. Other forms of armor were proposed and may have been used. On the French side at least, wire entanglements, formerly to be placed about 100 meters in front of the trench, were placed in immediate contact with it. The use of this obstacle was extended by the Turks in the Gallipoli peninsula to the shoal waters in front of possible landing places. These entanglements were so thick, so strongly set, and so deep that usually only artillery fire would open a way through them, though in some cases it was found possible to throw hooks in among them, and then to uproot the system by motor cars. Where possible, the system was electrified before an expected assault. Periscopes appeared on the western front for observation in the trenches.

The "clear field of fire" in front of a defensive position, recommended by all the textbooks before this war, became a thing of the past; it was found safer to conceal the trench and, incidentally, to let the enemy come up without suspecting its existence. We may regard the disappearance of this "field of fire" as one of the positive results in respect of operations.

The machine gun played a tremendous part in the struggle. The Germans were better provided with this weapon than the Allies, and had counted on their use in the open field, as much as they were compelled to use them in the trenches. Here they proved most effective, so much so, that it was remarked "the French hold their positions with artillery, the British with infantry, the Germans with machine guns." The British accordingly organized their machine gun service, to be divided into three branches: cavalry of the line, infantry of the line, motor service. In the cavalry and infantry, brigade machine gun squadrons and companies were to be formed, the motor service was to have machine gun batteries. It is said that the Germans entered the campaign with 50,000 of these weapons, and probably increased the number during the year.

Inasmuch as the "trenches" on both sides were so strong in themselves, and so heavily manned (at the rate, according to some reports, of 15 men per running meter), frontal assaults, about the only kind possible, called for the intensest artillery preparation. And here, as in other cases, the existence of trenches worked a sort of revolution, in that shrapnel, the best man-killing projectile thus far known against troops in the open, or against troops in open shallow trenches, became practically useless. Hence resort was had to high explosive shell, to blast away the trenches before an attack could be made. It was only by using this sort of shell that the overhead cover of the trenches could be destroyed and their occupants put out of business. The effect of these shells was de-

scribed as something terrible; literally no living being, whether animal or vegetable, could maintain itself under them. Tactically, where possible, the artillery delivered a *tir de barrage*, "curtain fire," between the assaulting troops of its own side and the counter-assaulting troops of the adversary. Through this curtain, nothing could pass alive.

The artillery in general kept up its supremacy and efficiency, with the French 75 millimeter unquestionably the supreme piece of its calibre. As a result of the conditions outlined above, i.e. that armies have become, as it were, stationary, that combats are of longer duration, and will tend more and more to resemble siege operations, heavy field artillery increased in importance, an importance foreshadowed in previous wars. Moreover, long range guns proved a great success; indirect fire became the normal case. Hence it is more than probable that heavy pieces will hereafter be the mainstay of field artillery. Experience has shown that with motor transportation heavy guns can easily be carried along with the mobile army. The 15-centimeter howitzer, range 10,000 meters, may prove to be a standard piece. But this should not be held to exclude the light field gun, heretofore the classic piece of armies in the field. According to some authorities, the tendency is to reduce the weight of this gun so as to increase its maneuvering ability and improve its cooperation with infantry. Similarly in the infantry it was predicted that the substitution of the automatic, or properly speaking, semi-automatic, shoulder rifle for the hand-operated arm, was inevitable. These matters are mentioned as marking the tendencies of the experience gained in the war. Two pieces, the German 28-centimeter howitzer and the Austrian 30.5-centimeter automobile mortar, were mentioned as having wrought the greatest destruction of forts. The Austrian piece with its equipment forms a complete traction set for road transportation; three traction engines, each pulling four trailers, were used for each two mortars. But it should be recollected that in no other war has it been made so plain that the objective is the defeat of the enemy army, not the destruction of forts or the capture of provinces. This piece was, however, also used against troops, and its effects were said to have been terrific, such as, for example, the annihilation of an entire battery of artillery and of a large number of infantrymen by a single shell. Men in the neighborhood who were not hit, nevertheless were killed by the intense air pressure and suffocating gases.

In general, calibres of from 15 centimeters to 21 centimeters were used on the battlefield. A direct result of the new artillery will be, as it already has been, the vanishing value of fortresses. Strong infantry trenches, in successive lines, protected by obstacles will become, have become, the rule. The guns of these positions will be distributed over the lines, thus causing the enemy fire to scatter, and will rely on their own concealment for protection.

The Italian field artillery changed its organization from 6-gun to 4-gun batteries, producing 294 batteries or 1176 guns. This change resulted in greater efficiency coming from greater mobility and from an increase in the ammunition. To a part of this artillery, a 75-millimeter gun of the Deport pattern was issued;

this gun fires a 16-pound shell. The split trail opens to 50 degrees in the firing position, and admits of elevation to 50 degrees. The French developed a new anti-aircraft gun, firing a 36-pound shell with a muzzle velocity of 1870 foot second. Its calibre is 4-inch, and weight, including armor and shields, about $2\frac{1}{2}$ tons.

Dirigibles on the whole proved to be a disappointment, if not a failure. The long-heralded raids against England accomplished absolutely nothing of military value. If dirigibles may be said to have developed a special function, it was as sea scouts, and they may, as is claimed, have been useful in protecting the German coast. They were no match for aeroplane attack, and hence were forced to operate at night. It was, nevertheless, reported that the German government had ordered Zeppelins of larger size than ever, at a cost of \$600,000 each. These were said to be blunt nosed, and sharp tailed, to have much higher speed than their predecessors, and to be fitted with tanks for carrying poisonous gas bombs. The emplacement of guns on the upper surface of these giants turned out to be a failure, because of the danger of igniting, by the flash of discharge, hydrogen leaking from the hull. To operate against these airships, the British government ordered, according to the press, the so-called "Zeppelin destroyers," the invention of an American named MacMechen. This "destroyer" was to bear the same relation to its prey as the destroyer of the sea to the dreadnought, and is said to be 236 feet long, 28 feet in diameter, to carry two motors of 200 horse power, to have a range of 300 miles, and a crew of four.

Aviation developed along the three lines of its usefulness, as an instrument of reconnaissance, as an invaluable coadjutor of the artillery, and as an engine of destruction. In this last capacity, its progress was not so great as in the other two. Raids were attempted, however, some of them of great length and in great strength, and instances occurred of damage done in these raids as also in shorter flights against special or accidental objectives near at hand. The aeroplane as an aid in artillery fire passed the stage of experimentation, and its value in reconnaissance became a commonplace. Experience showed that the biplane is superior to the monoplane. Some "battles" took place in the air, between squadrons of aeroplanes, and "duels" were not infrequent. In fact, as experience accumulated, the belief grew that the best way to get rid of a winged visitor was to attack him in and by another aeroplane. Experience further showed that an aeroplane could stand a good deal of punishment in the way of hits, before being forced to come down, as little structural harm is done by bullets. However, they may set the petrol tanks on fire, which suggested the use of fibre tanks. In general it may be asserted that during the year the art or science of flying was so advanced that work was possible under almost any conditions of weather. Aero squadrons were formed by the French for the purpose of operating against the enemy's communications just before or during battle. The squadrons employed three different types of machine, the bomb plane, the gun plane, and the chaser, whose functions are sufficiently well indicated by their respective names. These squadrons

made numerous raids on railway centres in the area of operations. In respect of type, the French adopted armoring of aéroplanes; this cuts down speed and carrying ability, but permits reconnaissance at a lower altitude than is possible for unarmored machines. A special example was the Blériot two-seated tractor, with the gunner, pilot, tank, controls, engine, and 160 horse power (Gnome) motor completely enclosed by a casing of 3 millimeter chrome steel. Still another is the Clément-Bayard monoplane for cavalry and artillery, with armor 1 millimeter thick. The Nieuport armored aéroplane carries armor 3.5 millimeter thick. From Germany was reported a biplane of 42.5 meters spread, with 3 propellers and 300 horse power motors, crew of 8 men to carry 12 22-pound bombs, 5 machine guns, and 8 hours' supply of fuel. The latest example of German ingenuity was a "battleaéroplane," spread 80 or 100 feet, engines 2 Mercedes, 100-150 horse power, to carry a pilot, 2 gunners, and 2 machine guns, so mounted as to fire in any direction. Each engine had its own special fuselage, the crew being in a car between the engine "rooms." These machines were expected to stay up six hours on patrol duty, and were said to be more powerful than any in the hands of the Allies. The French, however, turned out toward the end of the year, a new bombing triplane, 70 feet spread, height of wings 20 feet, crew 2 pilots, 2 observers, 2 gunners (but 12 may be carried), 4 3.7-millimeter guns, speed over 80 miles per hour, and engines of at least 300 horse power. Paris was, after March, 1915, free from aeronautic attacks, thanks to the measures taken to beat them off. These consisted of an elaborate system of observation posts connected by telephone with Paris, anti-aircraft batteries, and aéroplane stations at a dozen different points each ready to send up its squadron on five minutes' notice. Listening megaphones were also installed to catch the whirr of approaching planes. Anti-aircraft artillery in general improved to such an extent that aviators were not safe at 10,000 feet. Experience obtained showed that the anti-aircraft gun must have a high muzzle velocity, be a quick firer, a rapid loader at high angles of elevation, must have all around fire, and use a projectile permitting of observation of fire. Some (German) shells, for example, opened out a parachute, to enable the gunner to correct subsequent shots. See also AERONAUTICS.

The experience of railroad and motor transport simply confirmed what was said in the YEAR BOOK of 1914. But the armored automobile protected by a 3-millimeter shield of chrome nickel or tempered steel, exceeded expectations: by a special extension frame, both front and rear, ditches equal in width to the wheel base could be crossed.

Data in respect of losses are so inaccurate as to be untrustworthy. The total of killed, wounded, missing, and prisoners on Aug. 1, 1915, was reported at 8,630,000. The cost of the war, it was estimated in October, would be \$20,000,000,000, in 1916. We are better off, however, in respect of sanitation. In the British army typhoid was reported as practically conquered in this war, thanks to the use of anti-typhoid inoculation. Cholera and typhus were announced from time to time as having broken out, but were promptly checked. Serbia, how-

ever, suffered severely from typhus. Russia furnished three so-called "bath trains" each of twenty coaches for her troops. While bathing, each man had his linen disinfected, etc., and was furnished on coming out with his disinfected outfit and with a bag of clean linen. At the outbreak of the war England directed the great railway companies to provide a number of special trains for the carriage of sick and wounded soldiers. Each train had an operating coach. Bavaria equipped 14 hospital trains. The 15th train, a gift to the government, called the "train de luxe," was designed to carry 200 wounded, and consisted of 29 coaches, 14 of 14 beds each, 1 for wounded officers, 1 operating and X-ray, 1 disinfecting, 1 for lighting plant, 2 for surgeons, nurses, and clergy, 2 for sanitary personnel, 1 office, 1 kitchen, 1 provision, 1 storeroom, 3 baggage. The operating car had electric lights.

The difficulty of guarding against infection of wounds was very great. Powerful magnets came into use to find bullets and fragments of shrapnel and shell; in the location of bullets, or fragments, two X-ray photographs under different angles, would be taken to fix their position. The sharp pointed bullet made remarkably severe wounds on account of its crater-like exit from the body. Many of the wounds reported on all fronts were slight, permitting ready return to duty. The casualties, therefore, sound more terrible than they are in reality.

Thus the French government issued some remarkable figures showing the percentage of men that recovered or were recovering, and therefore would be fit for service again. The figures taken are up to Dec. 1, 1914:

Wounded, but fit for almost immediate return to the front	54.50 per cent
Wounded, on leave	24.50 " "
Wounded and still in hospital	17.40 " "
Permanently disabled, unfit for future service	1.46 " "
Wounded and died from wounds	3.48 " "

A traveling motor X-ray apparatus was devised to supply the needs of the smaller hospitals. In the treatment of facial wounds, the dental surgeon was said to have done wonders, greatly assisted by X-ray apparatus. A feature of the year was the effort of the governments interested to find occupation for the employment of war cripples.

In respect of the observance of the laws of humanity, of the Hague Conventions, and of the prescriptions of International Law, there was a retrogression.

MILITARY TERRITORY OF THE NIGER. A territory of the government-general of French West Africa. The capital is Zinder. The country is well adapted to agriculture and grazing. The Touaregs devote themselves to the raising of camels, and the Peuhls to the raising of cattle and sheep. There are no railways. Transport is by pack animals. A commandant administers the territory under the control of the Lieutenant-Governor of the colony of Upper Senegal and Niger. See FRENCH WEST AFRICA.

MILITIA. The aggregated strength of the organized militia in 1915 was 8705 commissioned officers, and 120,693 enlisted men—a decrease over 1914 of 87 officers, and an increase of 1442 men. Definite progress was made during the year toward the development of the

militia into an official field force. Correspondence courses for officers were carried on in a majority of the States. The demand for regular officers of State camps of instruction greatly exceeded the supply.

There were on Oct. 1, 1915, 1557 companies of infantry organized in 124 regiments; 27 battalions; and 26 separate companies. The cavalry in the organized militia was equivalent to about eight regiments. There were in all 12 divisions of field artillery. In the coast artillery, the total number of companies was 126. In the engineer corps there were, in 1915, 68 commissioned officers and 1193 enlisted men.

During the summer of 1915 camps of instruction were held in various parts of the country. These included camps for officers and non-commissioned officers of the sanitary troops. Officers from many States attended the field artillery schools at Fort Leavenworth, Kan., and completed the course there. The strength of the organized militia in each of the States in 1914-15, as reported by inspecting officers (in 1915, less the strength of organizations not recognized by the War Department), is shown by the following table:

State, Territory or District	1914		1915	
	Officers	Enlisted men	Officers	Enlisted men
Alabama	163	2,609	164	2,615
Arizona	45	645	58	742
Arkansas	109	1,402	105	1,547
California	252	3,804	249	3,440
Colorado	122	1,933	119	1,637
Connecticut	177	2,511	195	2,772
Delaware	41	465	40	450
District of Columbia	124	1,721	129	1,847
Florida	73	1,075	95	1,320
Georgia	225	2,490	229	2,714
Hawaii	56	858	61	905
Idaho	58	839	58	846
Illinois	508	5,447	522	5,550
Indiana	169	2,109	132	2,077
Iowa	217	3,014	211	3,092
Kansas	132	1,720	123	1,812
Kentucky	164	2,210	168	2,329
Louisiana	65	1,009	68	1,044
Maine	108	1,434	101	1,288
Maryland	157	1,986	156	1,917
Massachusetts	424	5,369	426	5,653
Michigan	189	2,478	188	2,773
Minnesota	220	3,243	227	3,280
Mississippi	94	990	78	1,127
Missouri	244	3,840	227	3,872
Montana	40	636	45	668
Nebraska	132	1,384	119	1,474
Nevada	..	..	..	..
New Hampshire	90	1,280	91	1,323
New Jersey	304	4,014	296	4,176
New Mexico	57	910	60	851
New York	974	15,591	1,002	15,607
North Carolina	209	2,367	211	2,809
North Dakota	60	679	56	676
Ohio	490	5,637	487	5,309
Oklahoma	77	1,380	69	1,023
Oregon	100	1,401	104	1,622
Pennsylvania	745	10,190	762	10,266
Rhode Island	96	1,303	90	1,316
South Carolina	156	1,794	136	1,589
South Dakota	68	873	67	975
Tennessee	117	1,798	107	1,639
Texas	192	2,731	145	2,091
Utah	29	419	32	566
Vermont	75	817	73	730
Virginia	206	2,606	200	2,703
Washington	88	1,312	82	1,234
West Virginia	104	1,517	117	1,607
Wisconsin	193	2,931	196	3,095
Wyoming	54	760	34	598
Total	8,792	119,251	8,705	120,693

* No Organized Militia (mustered out May 20, 1906).

MILK. See AGRICULTURE; AGRICULTURAL LEGISLATION; and DAIRYING.

MINERALOGY. NEW TREATISES. Among recent publications of general interest may be named *The Turquoise*, by J. E. Pogue, one of the series of memoirs issued by the National Academy of Sciences, and *Catalogue of the Meteorites of North America* by O. C. Farrington, with the same imprint. Each is a comprehensive and authoritative work in its special field, not too technical in treatment for the average reader. In the same category may be included the *Guide* issued by the Museum of Practical Geology in London for its collections of kaolin and china-clay; this is designed, of course, as a popular treatise, but contains much that will interest the expert, for example, the chapters on the origin of kaolin and the chemical and physical properties of china-clays from different parts of the world.

SILICATES. The silicate minerals which participate in the composition of the igneous rocks afford many problems that are interrelated with both geology and mineralogy, notably the problems connected with the formation and conditions of stability of silicate mixtures. Their study, hitherto, has been limited mostly to comparative methods, such as could be applied to products of the furnace without any close control of the physical conditions. Recently the Carnegie Geophysical Laboratory has undertaken their investigation, with refinements of mechanical equipment and scientific skill which that institution is able to command. A paper by Rankin gives the results of experiment with compounds of the system lime-alumina-silica. From this system he obtained a variety of artificial minerals, including quartz, tridymite, cristobalite, corundum, wollastonite, sillimanite, and anorthite, besides several calcium silicates not known to occur in nature, but present in certain artificial products. The results throw light upon the character of the compounds formed in the hardening of Portland cement which long has engaged attention. He finds, also, that eutectics are produced from silicate mixtures of the kind under investigation that differ little from other mixtures in regard to structure, except that they are of finer grain. Andersen discusses the system anorthite-forsterite-silica and shows that forsterite like the related mineral olivine, an important constituent of certain igneous rocks, undergoes resorption by the magma and apparently without any change of physical environment. Spinel may be formed as a primary phase of such a mixture. Bowen's experiments with silicate melts seem to afford a partial elucidation of the process by which igneous magmas in cooling and consolidating become separated into bodies of different mineral composition. He observed that the crystals as they separate out from the magma have a tendency to sink to the bottom, which inevitably leads to a vertical distribution of the components, the several layers representing the products of successive periods of crystallization. It has been surmised from study of the igneous rocks that such an explanation might hold good.

DIAMONDS. Among the important diamond fields the Brazilian deposits appear somewhat anomalous in that the stones are not associated with igneous rocks, as in South Africa where the mines are located upon the outcroppings of volcanic necks, but are distributed through beds of gravel. According to Harder and Chamberlin, who have investigated the diamondiferous

area of Minas Geraes, the deposits are found on the tablelands or "chapadas" which for the most part are made up of quartzite in flat-lying beds. Over this quartzite here and there occur remnants of once extensive sheets of gravel, sand, and clay. The gravel consists mainly of quartz pebbles, which bear evidence of having been derived from the quartzite, with scattered pebbles of igneous and metamorphic rocks and diamonds. They think it not unlikely that all the pebbles come directly from the quartzite, in which case the origin of the diamonds is to be sought in the same material; an alternative hypothesis is that some of the pebbles were brought into their present place by streams draining from distant sections where igneous rocks outcrop, so that the original home of the diamonds may still have been in that environment. The conglomerate of the uplands has been worked over by streams in the interval since its formation and secondary diamond deposits have come into existence, some of which are found along the present streams. The Brazilian stones are noted for their purity of color and brilliancy, and some of the most noted gems are from that country, but they are not so actively mined as formerly.

NEW MINERALS. The following list of new minerals supplements the lists contained in preceding volumes of the YEAR BOOK. *Ussingite* is a sodium-aluminum silicate, of violet-red color and triclinic habit. It comes from Klangerluarsuk, Greenland. *Faratsihite*, a hydrated ferric silicate, is from Faratsiho, Madagascar. It occurs as hexagonal scales of yellow color and is regarded as a kaolinite in which part of the aluminum is replaced by iron. *Speziaite* is a green fibrous amphibole, found in pyroxenite at Riondello, Traversella. *Lublinite*, supposedly a monoclinic form of calcium carbonate, is possibly only a soft earthy variety of calcite, pseudomorphic after organic remains. *Uvanite* is a combination of uranic and vanadic oxides, similar to carnotite except for its yellowish color. The type locality is Temple Rock, Utah. *Pintadoite* derives its name from Cañon Pintado, Utah, where it forms a green efflorescence on the sandstone cliffs. It is a hydrous calcium vanadate. *Hewettite* and *metahewettite* have the same composition, calcium vanadate with water; the former comes from Minosragra, Peru, and the latter from the Paradox Valley, Montrose County, Colo. *Pascoite*, also a calcium vanadate, from Minosragra, Peru, is distinguished by a deep orange color; it builds crystal clusters of possibly monoclinic form. *Footsite*, the hy-

drous copper chloride, possesses the same chemical composition as connellite and is otherwise identical with it, and cannot rank, therefore, as an independent species.

MINERAL PRODUCTION OF THE UNITED STATES. A summary of the mineral productions of the United States in 1914 is given below; the productions of the leading minerals and metals is given separately.

GOLD: The total production of gold in the United States in 1914 was \$94,500,000. The total production in the world is about \$460,000,000, of which the United States produces 20 per cent.

SILVER: The production of silver has gradually increased, until, in 1914, the largest recorded was 72,400,000 ounces. The production of the world is about 225,000,000 ounces per year, of which the United States produces one-third. Three-fourths of the world's silver production is derived from North America.

IRON ORE AND PIG IRON: The production of iron ore in 1913 was about 60,000,000 tons. The pig iron produced was more than 30,000,000 tons, valued at \$458,000,000. The United States produces about 40 per cent of the world's iron.

COPPER: The world's production of copper is about 2,211,000,000 pounds per year, of which the United States produces 60 per cent.

LEAD: The production of lead in 1914 was 542,000 tons, about 34 per cent of the world's production. There were produced in 1915 about 600,000 short tons.

ALUMINUM: The production of aluminum in the United States in 1914 was the largest in the world—79,129,000 pounds.

COAL AND COKE: The production of coal in 1914 was 513,525,477 short tons, valued at \$681,490,643. The production of coke was 34,555,914 short tons, valued at \$88,334,217.

PETROLEUM: The world's production of petroleum in 1914 is estimated at 400,500,000 barrels, of which the United States furnished 66 per cent. The production of petroleum in the United States in 1915 was 267,400,000 barrels.

NATURAL GAS: The quantity of natural gas in the United States in 1914 is estimated to have amounted to 592,000,000,000 cubic feet, valued at \$94,000,000.

CEMENT: The production of cement in 1914 in the United States was 88,230,170 barrels, valued at \$92,557,617.

See also METALLURGY.

The following table is issued by the United States Geological Survey:

MINERAL PRODUCTS OF THE UNITED STATES
CALENDAR YEARS 1913 AND 1914

Product	1913		1914	
	Quantity	Value	Quantity	Value
METALLIC				
Aluminum (consumption).....pounds.	72,879,000	\$18,845,000	79,129,000	\$14,522,700
Antimonial lead.....short tons (2000 pounds).	16,665	1,591,854	16,667	1,572,167
Antimony.....do.....	2,508	429,868	2,705	576,501
Bauxite.....long tons (2240 pounds).	210,241	997,698	219,318	1,069,194
Chromic iron ore.....do.....	255	2,854	591	8,715
Copper, value at New York City.....pounds.	1,224,484,098	189,795,335	1,150,137,192	152,968,246
Ferroalloys.....long tons.	296,207	13,015,362	255,524	9,350,245
Gold.....do.....	4,299,784	88,884,400	4,572,976	94,581,800
Iron.. { Ore.....long tons.	59,643,098	130,905,558	89,714,280	71,905,079
{ Pig.....do.....	30,388,935	458,342,345	22,263,263	298,777,429
Lead (refined), value at New York City.....short tons.	411,878	36,245,264	512,794	89,997,932
Manganese ore.....long tons.	4,048	40,480	2,635	27,877
Manganiferous ore.....do.....	59,403	25,124	98,265	218,497
Nickel, value at New York City.....pounds.	481,565	79,393	845,334	313,000
Platinum and allied metals, value at New York City.....troy ounces.	1,984	46,530	6,324	280,885

MORE, PAUL ELMER. See LITERATURE, ENGLISH AND AMERICAN, *Essays*.

MOROCCO. An African sultanate chiefly under French protection by virtue of the treaty of March 30, 1912. Area, exclusive of the Tuat and the desert, 439,240 square kilometers (169,591 square miles). The area of the French protectorate is given at 416,800 square kilometers, with an estimated population of 3,000,000. The Spanish concessions cover about 21,800 square kilometers, with about 404,000 inhabitants; Tangier, which is to be internationalized, has 600 square kilometers, and 60,000 inhabitants. Fez is the capital, with 101,820 inhabitants; Morocco (Marakesh), 60,034; Rabat, 47,144; Tangier, 46,270. The inhabitants are chiefly Berbers, Bedouins, and Mued Arabs and Tuaregs, and belong to the Malekite sect of the Sunnite Mohammedans.

The mineral resources are undeveloped, the majority of the people being engaged in grazing and agriculture of a primitive kind. There is a limited manufacture of carpets and slippers. There are no authoritative financial statistics; customs duties bring about 10,000,000 francs annually, and the sultan's budget is placed at about 7,000,000. Imports and exports by countries follow, values in thousands of francs:

	Imports		Exports	
	1911	1912	1911	1912
United Kingdom.....	29,884	50,725	19,644	15,617
France	45,859	49,958	81,873	16,540
Germany	7,861	18,209	17,429	17,889
Spain	2,871	5,845	9,180	8,795
Belgium	2,245	4,073	732	442
United States	718	782	758	411
Italy	321	1,094	2,518	5,250
Other	5,170	9,208	1,971	2,160
Total	94,279	152,497	83,600	75,047

Principal exports in 1911 and 1912 respectively: barley, 11,627 and 19,332 thousand francs; hides and skins, 7151 and 4764; cattle, 6454 and 2327; eggs, 5740 and 6125; almonds, 5668 and 4127; wool, 5263 and 1580; wheat, 5203 and 6579; flax, 4548 and 5005; vegetables, 4278 and 7113; canary seeds, 1814 and 1224; slippers, 1420 and 1078; corn, 1201 and 1201; wax, 1123 and 872.

Vessels entered in the 1912 trade, 3679, of 2,921,000 tons. Vessels entered 1910, 3194, of 2,562,549 tons. There are no railways. Reigning Sultan, Mulai Yussuf, son of Mulai Hassan; proclaimed at Fez Aug. 17, 1912, in place of his brother, Mulai Abd-el-Hafid. There is a French resident commissioner-general; a Spanish high-commissioner resides at Tetuan.

MORRIS PLAN BANKS. See LOAN SHARKS.

MORTALITY STATISTICS. See VITAL STATISTICS.

MOSQUITO. See MALARIA.

MOTHERS' PENSIONS. See PENSIONS FOR MOTHERS.

MOTOR-BOATING. See YACHTING.

MOTOR FIRE APPARATUS. See FIRE PROTECTION.

MOUNT HOLYOKE COLLEGE. An institution for higher education of women founded in 1836 at South Hadley, Mass. The total enrollment of undergraduate students in 1915 was 783. There were in addition eight graduate students. The faculty numbered 93, and in ad-

dition there were 28 assistants, readers, and secretaries. Dr. Colin A. Scott, formerly the head of the department of education at the Boston Normal School, was appointed professor of education. Noteworthy benefactions included \$25,000 from Mr. and Mrs. Norman Wait Harris, of Chicago, to complete an endowment of \$50,000 for the department of zoölogy. The productive funds of the college at the end of the fiscal year 1915 amounted to \$1,594,763, and the income to \$373,910. The library contained 58,200 volumes.

MOVING PICTURES. See PHOTOPLAYS.

MULRY, JOSEPH. American Roman Catholic priest and educator, died 1915. Appointed in 1915 president of Fordham University. He was born in 1872 and at the age of 15 entered the Jesuit Order. In 1905 he was ordained a priest. For several years he taught classics in Georgetown College, and was for one year vice-president of Loyola College in Baltimore. He was later prefect of discipline and athletic director at Georgetown University. He then became president of St. Peter's College at Jersey City, and held this position until the time of his appointment as president of Fordham. He was well known as one of the most eloquent orators of the Catholic Church in America, and as an efficient educator.

MUNICIPAL BUILDINGS. See ARCHITECTURE.

MUNICIPAL FRANCHISES. See MUNICIPAL GOVERNMENT, *Model City Charter*.

MUNICIPAL GOVERNMENT. The past year, like 1914, was characterized by slackening in the adoption of the commission plan and rapid gain in the city manager plan. There was also some further gain in municipal home rule, but much disappointment among home rulers in New York State over the defeat of the proposed home rule amendments proposed by the Constitutional Convention and buried by a half million adverse votes in November. Preferential voting made considerable gain. Proportional representation (see section below), a novelty in the United States, was established at Ashtabula, Ohio. Model forms for home rule constitutional amendments and a city charter of the commission-manager type were brought to a finish by a committee of the National Municipal League. These and a few other salient features of municipal government activities in 1915 will be reviewed in the following paragraphs.

COMMISSION PLAN. Nearly 500 cities have adopted commission government. Owing to a lack of uniformity in classification and the incompleteness of the reports for the last month or two of the year it was impossible to give exact figures of the growth and present status of the movement. The best figures available, under a liberal definition of commission government, show the number of cities so governed in various years:

1901	1	1911	96
1905	1	1912	67
1906	0	1913	112
1907	7	1914	45
1908	5	1915	39
1909	23	Unknown	7
1910	66		
		Total	469

The 1915 accessions (see YEAR BOOKS for 1913 and 1914 for earlier records), so far as reported, are shown by the accompanying table.

LIST OF CITIES REPORTED AS HAVING
ADOPTED THE COMMISSION PLAN
IN 1915 *

(From Records of the National Municipal League.)

Name of City	Population, U. S. Census of 1910
Bridgeport, Conn.†	102,054
Mechanicville, N. Y.	6,634
Saratoga Springs, N. Y.	12,693
Bayonne, N. J.	55,545
Bradley Beach, N. J.	1,807
Cape May, N. J.	2,471
Hoboken, N. J.	70,324
New Brunswick, N. J.	23,388
Coatesville, Pa.	11,084
Asheville, N. C.	18,762
Lincolnton, N. C.	2,413
Rome, Ga.	12,099
Apalachicola, Fla.	3,065
Orange Park, Fla.	872
Coal City, Ill.	2,667
Joliet, Ill.	34,670
Lincoln, Ill.	10,892
Paris, Ill.	7,664
Princeton, Ill.	4,181
Rockford, Ill.	45,401
Sterling, Ill.	7,467
Grand Rapids, Mich.	112,571
Munising, Mich.	2,952
Aurora, Mo.	4,148
Springfield, Mo.	35,201
Two Harbors, Minn.	4,990
Marmarth, N. D.	790
Jackson, Tenn.	15,779
Lawrenceburg, Tenn.	1,687
Cynthiana, Ky.	3,608
Harrodsburg, Ky.	3,147
Hopkinsville, Ky.	9,419
Kinsville, Ky.	7,305
Middlesboro, Ky.	7,305
Brownsville, Texas	10,517
Calvert, Texas	2,579
Yoakum, Texas	4,657
Helena, Mont.	12,515
Napa, Cal.	5,791
Santa Monica, Cal.	7,847

* The following cities should be added to the list for 1914, as reported in the 1914 YEAR BOOK: Madison, N. J., 4,658; Springfield, S. D., 675; Cleburne, Texas, 10,364; Long Beach, Cal., 17,089.

† Voted in favor of the proposition.

The largest city operating under the commission plan in 1915 was New Orleans, which had a population of 339,075 in 1910, but on Jan. 1, 1916, the plan was to go into effect in Buffalo, N. Y. (population in 1910, 423,715). At least 15 cities of more than 100,000 population have adopted commission government. Salem, Mass., voted to change from the commission plan, adopted in 1912, to the federal plan—known as Plan B, under the optional act of 1915. At the same time, Lynn, Mass., voted to make the opposite change. A strong effort to abandon the commission plan was defeated at Moline, Ill. At Spokane, Wash., an attempt to weaken the plan by making the corporation counsel and comptroller elective was defeated, but the salaries of the commissioners were decreased from \$5000 to \$3600 a year. Interesting complications under commission government at Nashville, Tenn., including litigation over the removal of the members of the commission and the appointment of a receiver by a lower court, and the nullification of the appointment by a higher court are outlined in *The National Municipal Review* for October, 1915. In the latter part of the year an expert accountant and engineers from New York City were making an investigation of the affairs of the city. A part of the complications of Nashville were due to misgovernment before the commission plan went into effect, and a part to over-confidence in the virtues of the mere change in the form of government.

CITY MANAGER PLAN. In the United States 74 cities had adopted and two had abandoned some form of city manager plan up to November, 1915. Two had also adopted it in Canada. As shown by the accompanying table, two-thirds of the cities in the list had populations of less than 10,000 in 1910. The two largest cities were Springfield, Ohio, and Dayton, Ohio, with populations of 46,921 and 116,577. The salaries paid in some of the cities are large—for city officials. Dayton pays its manager \$12,500 a year. A half dozen places pay \$5000 or \$6000. The widespread interest manifested in the plan indicates that it will be adopted in many more places in the next few years. Already four States—Massachusetts, New York, Virginia, and Ohio—have passed general laws permitting all or certain classes of cities to adopt the commission manager plan, and most of the cities in the entire list have this combination. Some observers go so far as to declare that neither commission nor manager can be successful except in combination—and there are strong arguments in support of this view. The commission plan by itself is weak because it attempts to select by popular vote men who, besides serving as representatives of and legislators for the people, are also chiefs of executive departments. Adding a city manager provides a single executive in place of five more or less independent but yet interdependent executives, and still enables the commission to make sure that its policies are carried into effect. Moreover, the best trained men in the whole field may be secured as city managers. Many of the city managers have been chosen from the engineering profession. This practice will doubtless be continued until facilities for special training for the position have been provided. Meanwhile, in fact always, city managers will often begin with the smaller cities in a managerial or other capacity, and go on and up from one city to another, as is true of some of the more important executive municipal positions abroad.

MUNICIPALITIES HAVING CITY MANAGERS

(As reported to Ossian E. Carr, Secretary City Managers' Association, up to November, 1915)

Name of Place	Population, U. S. Census of 1910	Date in Effect	Annual Salary
Norwood, Mass.	8,014	1914	\$3,000
Newburgh, N. Y.	27,805	Jan. 1916	6,000
Niagara Falls, N. Y.	30,445	Jan. 1916	5,000
Watertown, N. Y.	26,730	Jan. 1918	....
Grove City, Pa.	3,674	1914	2,000
Titusville, Pa.	8,538	Dec. 1913	....
Charlottesville, Va.	6,765	1913	....
Fredericksburg, Va.	5,874	....	....
Luray, Va.	1,218	....	....
Portsmouth, Va.	33,190	Sept. 1916	....
Staunton, Va.	10,604	Apr. 1908	2,500
Wheeling, W. Va.	41,641	Jan. 1917	....
Durham, N. C.	18,241	....	....
Elizabeth City, N. C.	8,412	Apr. 1915	....
Hickory, N. C.	8,716	May 1913	2,000
Morgantown, N. C.	2,712	May 1913	1,200
Thomasville, N. C.	3,877	1915	....
Beaufort, S. C.	2,486	1915	....
Rock Hill, S. C.	7,216	1915	2,400
Sumter, S. C.	8,109	Jan. 1912	3,300
Lakeland, Fla.	3,719	1914	2,100
Largo, Fla.	291	1913	600
St. Augustine, Fla.	5,494	1915	3,600
Johnson City, Tenn.	8,502	....	....
Ashtabula, Ohio	18,266	Jan. 1916	....
Dayton, Ohio	116,577	Jan. 1914	12,500
Sandusky, Ohio	19,989	Jan. 1916	....
Springfield, Ohio	46,921	Jan. 1913	6,000
Westerville, Ohio	1,908	1915	....
Alpena, Mich.	12,706	Apr. 1916	....
Benton Harbor, Mich.	9,185	1916	....

Name of Place	Population, U. S. Census of 1910	Date in Effect	Annual Salary
Big Rapids, Mich.	4,518	1914	1,500
Cadillac, Mich.	8,375	Mar. 1914	8,000
Grand Haven, Mich.	5,856	Jan. 1914	2,500
Jackson, Mich.	31,483	Jan. 1915	5,000
Manistee, Mich.	12,381	Apr. 1918	2,000
Glencoe, Ill.	1,899	1914	2,400
River Forest, Ill.	2,456	1914	....
Winnetka, Ill.	3,168	Jan. 1915	2,400
Horicon, Wis.	1,881	....	1,000
Bloomfield, Iowa	2,028	1912	680
Chariton, Iowa	8,794	....	....
Clarinda, Iowa	8,882	1918	1,700
Iowa Falls, Iowa	2,797	1914	1,800
Webster City, Iowa	5,208	1915	....
Morris, Minn.	1,685	1918	1,600
Clark, S. D.	1,220	1912	960
Abilene, Kan.	4,118	1918	1,200
Mulberry, Kan.	997	1914	....
Amarillo, Texas	9,957	Jan. 1914	2,400
Denton, Texas	4,782	1914	....
San Angelo, Texas	10,321	Apr. 1916	....
Sherman, Texas	12,412	1915	....
Taylor, Texas	5,814	1914	....
Terrell, Texas	7,050	1918	....
Tyler, Texas	10,400	Apr. 1915	....
Montrose, Colo.	3,252	1914	1,800
Collinsville, Okla.	1,824	1918	2,000
Norman, Okla.	8,724	....	....
La Grande, Ore.	4,848	Jan. 1914	2,400
Snohomish, Wash.	3,244	1915	....
Roswell, N. M.	6,172	1914	1,800
Alhambra, Cal.	5,021	July 1915	....
Bakersfield, Cal.	12,727	May 1915	8,000
Glendale, Cal.	2,746	....	....
Holtville, Cal.	729	....	....
Inglewood, Cal.	1,538	1914	....
San Diego, Cal.	39,578	May 1915	6,000
San José, Cal.	28,946	July 1916	....
San Rafael, Cal.	5,984	....	....
Santa Barbara, Cal.	11,659	Jan. 1917	....
Phoenix, Ariz.	11,134	Jan. 1918	5,000
Tempe, Ariz.	1,473	1915	....
Tucson, Ariz.	13,193	1915	....
Maisonneuve, P. Q. ....	....	....	....
Port Arthur, Ont. ....	....	....	....

Meatmount, P. Q., not included by Mr. Carr, has previously been listed as a city-manager city.

MUNICIPAL HOME RULE. The essence of municipal home rule, as thus far enjoyed, is freedom on the part of each city to draw, adopt, and amend its own charter, without State legislative let or hindrance. To the considerable number of States, mostly west of the Mississippi River, that have granted this power to some or all of their cities, Connecticut and Florida were added in 1915. In Connecticut any municipality, including towns governed under special acts, was given authority to enact or amend a charter subject to conditions presented in the act. In Florida provision is made for charter-revision commissions whose recommendations may be approved or rejected by popular vote. A constitutional amendment adopted in Maryland gave considerable home rule authority to the counties of that State and to the city of Baltimore. See below, section *Model City Charter*.

OPTIONAL CHARTERS IN MASSACHUSETTS. Following in spirit the example set by New York, Ohio, and Virginia, the Massachusetts Legislature passed an act (Chapter 267 of 1915), enabling cities to choose between four types of charters. This action was all the more notable because before that time the Legislature of that State had usually compelled every city wishing a new charter to secure a special act for that purpose. Hereafter Massachusetts cities may choose between: Plan A, which provides for a mayor and a council elected at large, the mayor to appoint and to have power to remove all department heads and municipal boards ex-

cept members of the school committee, without confirmation by the council; Plan B, a mayor and council, the council to be elected partly by wards and in part at large, and the mayor to appoint and remove all heads of departments and boards, subject to the approval of the council; Plan C, the commission form; Plan D, the commission-manager form, the commission or council to consist of five members, and the member receiving the highest number of votes to be mayor but with no extra powers except that of presiding over the council and being the "official head" of the city.

PREFERENTIAL VOTING. This system, permitting each voter to express first, second, etc., choice among the various candidates for a given office, and to have his other choices counted in case his first choice candidate is not elected, has been adopted by at least 48 cities of the United States, having a combined population of slightly over 2,500,000 in 1910. These cities are given in the accompanying table, made up from *The National Municipal Review* for July, 1915, and January, 1916:

Date	City	Population, 1910
1909	Grand Junction, Colo.	7,754
1910	Spokane, Wash.	104,402
1911	Pueblo, Colo.	44,895
1912	New Iberia, La.	7,499
1913	Duluth, Minn.	78,466
1913	Houston, Texas	78,800
1913	Denver, Colo.	218,881
1913	Colorado Springs, Colo.	29,078
1913	Portland, Oreg.	207,214
1913	Nashua, N. H.	26,005
1913	Cleveland, Ohio	560,668
1913	La Grande, Oreg.	4,843
1913	Fort Collins, Colo.	8,210
1913	St. Petersburg, Fla.	4,127
1913	Cadillac, Mich.	8,875
1914	Columbus, Ohio	181,548
1914	Jersey City, N. J.	267,779
1914	Trenton, N. J.	96,815
1914	23 other places in New Jersey ....	....
1915	Paterson, N. J.	125,600
1915	Five other places in New Jersey ....	....
1915	Toledo, Ohio	168,497
1915	Portland, Me.—Water District	66,042

All 31 of the New Jersey cities were brought under preferential voting by an amendment to the general statute permitting cities to adopt the commission plan of government. A number of the other cities in the list also have commission government. In nearly all of the cities listed preferential voting has supplanted primaries. The New Jersey act of 1914 was upheld by the State Supreme Court on April 21, 1915. Seattle, Wash., rejected preferential voting in March, but the council at once voted to resubmit it to popular vote in March, 1916.

PROPORTIONAL REPRESENTATION. Election by a plurality of votes often leaves a large percentage of the voters unrepresented, and sometimes results in the election of one or more candidates by a small minority of the voters. To secure representation of all classes of voters or shades of opinion, within reasonable limits, proportional representation has for some time been practiced abroad and long been urged in the United States. On August 10th, Ashtabula, Ohio, adopted the Hare system of proportional representation by an amendment to its home rule charter. By this vote Ashtabula took the lead in this particular, so far as the United States and Canada are concerned. The system was first tried in Ashtabula at the No-

vember election, and is said to have worked satisfactorily. Under it the seven members of the council or commission are voted for somewhat as explained above under *Preferential Voting*, but the votes are so counted that each group consisting of one-seventh of all the voters, secures a representative. The history and theory of proportional representation and some details of the Ashtabula plan are given in *The National Municipal Review* for October, 1915. Full details of the plan adopted at Ashtabula and of the votes under it, and how they were distributed, are given in a pamphlet published by the Ashtabula Chamber of Commerce.

MODEL CITY CHARTER. Constitutional provisions for municipal home rule and a model city charter of the commission-manager type, were completed in rough draft form just at the close of 1915 by the Municipal Programme Committee of the National Municipal League (q.v.). It was expected that the exact phrasing of the draft would be finished early in 1916, and that the draft would then be mailed to the members of the league for adoption by letter ballot. A municipal programme, consisting likewise of constitutional amendments and a model charter, was adopted by the league in 1899. The programme was a notable constructive contribution to American municipal government. Wherever adopted it gave cities the right to frame their own charters (this feature, only, was limited to cities of 25,000 population and upwards); separated city from State and uniform elections; authorized direct legislation, and minority or proportional representation; provided for uniform municipal accounting throughout the State; established the so-called federal plan of city government, with a mayor as sole executive officer, having exclusive powers of appointing all department heads except the finance department; provided the merit system; and limited election by popular vote to the mayor and members of the council—as does the “short ballot” of later years. Until the commission plan came into prominence in 1907, the model charter of 1899 profoundly affected charter drafting in the United States, and many of the principles of the model charter continued to gain in popularity, and were adopted in various places. The commission plan is in sharp contrast with the municipal programme of 1900, in that it combines all legislative and executive functions in a small commission, whereas the programme had most carefully separated those functions, as already stated. The advent of the city manager plan and its combination with the commission plan, on the heels of which it followed, was in a large degree a return to the separation of executive and legislative functions, but with a difference which the purists consider of the utmost importance, namely, that in the place of the independent executive or mayor of the federal plan or municipal programme, there is put the controlled executive, or city manager, to whom is entrusted the carrying out of the policies determined by the council or commission.

Under the new municipal programme a State which had not already done so, would adopt constitutional amendments giving all cities and villages the choice between incorporation under general State laws and framing their own charters, the latter to be done by means of a commission elected by popular vote and reporting

a charter—also subject to popular approval. Besides authority to frame their own charters, the new municipal programme grants cities full power to regulate all their own affairs except in matters of State-wide concern. Full powers of municipal ownership are also granted. The principle of State administrative control is recognized to some extent. The new model charter provides for the usual small council or commission; a city manager in complete charge of the executive work of the city; nomination by petition; preferential voting for members of council, elected at large, or, as an alternative to preferential voting, proportional representation; the recall of elective officers; the initiative and referendum; and civil service. Under the city manager there would be six administrative departments for the larger cities, with consolidation into fewer for the smaller ones. Each of these six heads must be chosen for “general executive and administrative experience and ability,” and “education, training, and experience in the class of work which he is to administer.” The six department heads are named and defined as follows: “The director of the department of law shall be a lawyer; of public health a sanitary engineer or member of the medical profession; of public works and utilities an engineer; of education a teacher by profession; of public safety and welfare a man who has had administrative experience; and of public finance a man who has had experience in banking, accounting, or other financial matters; or in each case the man must have rendered active service in the same department in this or some other city.”

A city planning board to pass upon everything affecting the plan of the city is provided for. This board would consist of the director of public works and utilities, the director of public health, and three citizens chosen for their knowledge in city planning. In the smaller cities, having no director of health, one citizen member would be omitted, leaving a board of three members. The board would make studies and recommendations for improvements to the city plan, as well as pass upon all proposed changes in the city plan. One of its other duties would be to submit yearly a programme of city improvements for at least three years to come, with proposals for meeting the cost. It would employ a man with a knowledge of city planning as secretary, have power to engage city planning experts, and would be served by the city engineer, as needed, for all ordinary purposes. In order to harmonize with the general scheme of the charter, all recommendations of the city planning board would be subject to the approval of the council or commission.

The franchise provisions of the new model city charter are based on the following principles: The securing of the best utility service practicable; the fullest possible municipal control of the streets; the removal of obstacles to municipal ownership; as low rates as are consistent with the three foregoing principles. In accordance with these principles the character of each utility should be recognized; every franchise should be revocable on payment of just compensation; the control of utilities should be reserved to the city, subject to reasonable review by the courts or by a State utility commission; and private investments in pub-

lic utilities should be considered as aids to public credit and subject to public control.

Bibliography. Munro, *Bibliography of Municipal Government in the United States* (Cambridge, Mass.); James, *A Handbook of Civic Improvement* (Austin, Texas); Ryan, *Municipal Freedom* (New York); Mary R. Beard, *Women's Work for the City* (New York); Howe, *The Modern City and Its Problems* (New York); Howe, *Socialized Germany* (New York); Fosdick, *European Police Systems* (New York).

See also CITY PLANNING; GARBAGE AND REFUSE DISPOSAL; MUNICIPAL OWNERSHIP; ROADS AND PAVEMENTS; SEWAGE PURIFICATION; SEWERAGE; SMOKE ABATEMENT; STREET CLEANING; WATER-WORKS.

MUNICIPAL HOME RULE. See MUNICIPAL GOVERNMENT.

MUNICIPAL LEAGUE, NATIONAL. An organization formed in 1894 for study of municipal problems. Its membership on Oct. 31, 1915, was 2505. The 21st annual meeting was held at Dayton, Ohio, on Nov. 17-19, 1915. At the first session President Foulke delivered an address on "Coming of Age: Municipal Progress in Twenty-one Years." A preliminary report was made by the Committee on New Sources of Revenue (chairman, Robert M. Haig), in which it was declared that it would be a misdirection of energy to try merely to improve the old system of taxation by more strict administration. The Committee on Municipal Reference Libraries and Archives (chairman, Charles C. Williamson) recommended that efforts be made to have Congress make an appropriation for establishing a municipal reference division of the Library of Congress. There were also reports by the committees on franchises, on municipal courts, on civic secretaries, on bibliography, on the relation of the city to its food supply, on immigration, and on municipal programmes. There were papers read: "Progress of Home Rule in Ohio," by Mayo Fesler; "The Ashtabula Plan—The Latest Step in Municipal Organization," by Prof. A. R. Hatton; and "Professional Standards for the New Profession of City Manager," by Richard S. Childs. The officers elected at the meeting were as follows: President, Lawson Purdy; secretary, Clinton Rogers Woodruff; treasurer, George Burnham, Jr.; vice-presidents, Jane Addams, John Stewart Bryan, Richard S. Childs, Charles W. Dabney, Walter L. Fisher, Frank J. Goodnow, A. Lawrence Lowell, George McAneny, J. Horace McFarland, Robert Treat Paine, Leo S. Rowe, Charles Richardson, Chester H. Rowell, and Dudley Tibbetts; and 39 members of the council.

The essay prizes awarded in 1915 included: the Baldwin prize, for the essay, "A Critical Study of the Sources of Municipal Revenue in Any City Exceeding 50,000," to Miss Bernice Brown of Radcliffe College; the high school prize for "Fire Prevention," to Miss Margaret Reick, Milwaukee, Wis.; the Cincinnati prize, for "The Transportation Problem in Cincinnati," to Miss Cella Taylor of the University of Cincinnati; and the Portland-National Municipal League prize to David Kingsley Brace of Reed College, Portland, his subject being, "The Family and Socialized Play."

Eight volumes have been published in the National Municipal League series. Those appearing in 1915 were: *Woman's Work in Muni-*

icipalities, by Mary Ritter Beard; *The City Manager*, by Harry A. Toulmin, Jr.; *Lower Living Costs in Cities*, by Clyde L. King; *Satellite Cities*, by Graham R. Taylor. Two others were announced as nearly ready for publication, one on city planning by John Nolen, and one on experts in municipal life by H. S. Gilbertson. The league's official organ, the *National Municipal Review*, continued under the same auspices—Clinton Rogers Woodruff, editor, and John A. Fairlee, Adelaide R. Hasse, Herman G. James, and Howard L. McBain, associate editors.

MUNICIPAL OWNERSHIP. The municipal street railway of San Francisco, which comprised 48 miles of single track early in 1915, reported profits for its first year of operation. Further extensions were under consideration at the close of the year. At Detroit the purchase of the privately owned Detroit United Railway was defeated by a popular vote of 32,514 for, to 35,676 against, on November 2nd. The defeat was in a sense greater than the figures indicate, since a three-fifths majority was necessary to carry the proposition. On the same day a charter amendment which would have been required to put a favorable vote into effect, was carried by 121 votes, a bare majority being sufficient in this case. In April, 1913, a charter amendment authorizing municipal ownership of street railways at Detroit, was adopted by the large majority of 40,531 to 9542. In 1911 and in 1906 "settlement-franchise" propositions which would have given the street railway company a new lease of line and settled long-standing disputes between city and company were badly defeated. The purchase proposition voted down in 1915 provided for turning the street railway system over to the city, the purchase price to be determined by the six judges of the local county court. This proposition was opposed as being of the "blank check," or "pig-in-the-poke" order. It should be added that the commission created to carry out the Detroit United Railway purchase mandate of 1913 first proceeded to have an expert valuation of the property made, but no agreement could be reached between the commission and the company. At San Francisco the people voted down a plan for settling the long controversy between the city and the Spring Valley Water Company by city purchase at an agreed price of \$34,500,000, after which the appraisal of the property for taking by condemnation was resumed. However, some progress was made by San Francisco during the year on the city's great Hetch Hetchy project for bringing in a water supply from the Tuolumne River. Preliminary work was done and steps were taken to build a municipal railway for construction purposes. At St. Louis work was under way to provide approaches to the municipal bridge across the Mississippi River, the bridge itself already having been built by the city. St. Louis has for some years owned and operated a railway line from the city up the river to its water works pumping station. Waterfront railway ownership was extended in 1915, and two municipal docks were projected. A considerable portion of the Mississippi River waterfront is owned by the city. St. Louis is by no means alone in providing municipal docks. The same thing is being done by cities large and small on navigable streams, and on

the Atlantic, the Gulf, the Great Lakes, and the Pacific coast. Canada, as well as the United States, is planning this sort of enterprise. Foreign cities have been engaged in it for years.

Water-works ownership in the United States and Canada is shown in the accompanying table, which has been rearranged from *The McGraw Waterworks Directory*, 1915. A considerable number of the smaller works were probably not included in the original table, owing to failure of their owners to make returns. Of a total of 4400 works in the United States, 3045, or nearly 70 per cent, were municipally owned. In a number of States nearly all the works are under municipal ownership and in a few private ownership is almost complete. In Canada about 84 per cent of the works are owned by the cities they supply.

OWNERSHIP OF WATER-WORKS IN THE UNITED STATES AND CANADA, 1915

	No. of Towns Listed	Municipal Ownership	Private Ownership	Mixed Ownership	Supplied from other Towns
Maine	103	17	65	1	20
New Hampshire	43	26	17	..	..
Vermont	53	35	18	..	..
Massachusetts	209	145	51	1	12
Rhode Island	14	8	7	1	3
Connecticut	127	18	62	5	42
New England	549	244	220	8	77
New York	273	187	73	7	26
New Jersey	261	71	90	5	95
Pennsylvania	418	92	176	3	147
Delaware	11	7	4	..	..
Maryland	48	23	25	..	..
District of Columbia	1	1	..	..	..
Middle Atlantic	1,012	361	368	15	268
Virginia	45	25	14	..	6
West Virginia	45	21	22	..	2
North Carolina	66	57	8	..	1
South Carolina	32	22	9	..	1
Georgia	116	110	6	..	..
Florida	48	31	16	..	1
South Atlantic	352	266	75	..	11
Alabama	71	47	16	1	7
Mississippi	66	59	7	..	..
Louisiana	35	29	6	..	..
Tennessee	49	35	14	..	..
Kentucky	53	22	31	..	..
South Central	274	192	74	1	7
Ohio	196	156	34	..	6
Indiana	146	90	54	..	2
Michigan	118	95	19	..	4
Illinois	312	247	53	1	11
Wisconsin	101	83	17	1	..
North Central	873	671	177	2	23
Iowa	248	228	20	..	..
Minnesota	182	175	7	..	..
Kansas	170	154	15	..	1
Nebraska	98	95	1	..	2
North Dakota	27	24	3	..	..
South Dakota	48	45	3	..	..
Wyoming	21	19	1	..	1
Montana	33	18	14	..	1
Northwestern	827	758	64	..	5
Missouri	82	55	27	..	..
Arkansas	61	27	31	..	3
Texas	147	75	67	..	5
Oklahoma	94	87	6	..	1
Colorado	90	74	13	..	3
New Mexico	15	6	8	..	1
Southwestern	489	324	152	..	13

	No. of Towns Listed	Municipal Ownership	Private Ownership	Mixed Ownership	Supplied from other Towns
Washington	48	45	3	..	..
Oregon	55	35	19	..	1
California	250	81	186	11	22
Arizona	26	7	16	..	3
Nevada	29	11	14	..	4
Utah	21	18	3	..	..
Idaho	49	23	25	..	1
Alaska	7	..	7	..	..
Far Western	485	220	223	11	31
Hawaii	1	1	..	..	..
Philippine Islands	3	1	2	..	..
Porto Rico	7	7	..	..	..
Possessions	11	9	2	..	..
Newfoundland	1	1	..	..	..
Prince Edward Island	2	2	..	..	..
New Brunswick	17	15	1	..	1
Nova Scotia	31	27	3	..	1
Quebec	62	38	19	2	3
Ontario	129	114	13	2	..
Manitoba	11	9	2	..	..
Saskatchewan	15	15	..	..	..
Alberta	18	16	2	..	..
British Columbia	27	19	8	..	..
Total Canada	313	256	48	4	5
New England	549	244	220	8	77
Middle Atlantic	1,012	361	368	15	268
South Atlantic	352	266	75	..	11
South Central	274	192	74	1	7
North Central	873	671	177	2	23
Northwestern	827	758	64	..	5
Southwestern	489	324	152	..	13
Far Western	485	220	223	11	31
Possessions	11	9	2	..	..
Total United States ..	4,872	3,045	1,855	37	435

The status of water-works ownership in England and Wales is summarized in a British blue book published in 1915 (*Return as to Water Undertakings in England and Wales*; Local Government Board, London). The *Return* was ordered in 1910; most of the schedules were filed in 1911, but some not until 1913. At the end of 1913 proofs were sent out for revision, so most of the data in the *Return* were revised to January, 1914. Of 1130 boroughs and other urban districts outside London (where public ownership prevails), all but 29 had a piped water supply for at least some part of their areas. Of the 1101 urban districts with piped supplies, 822 were supplied municipally, and 394 privately—the excess of 115 being due to overlapping. Of 97 towns having populations of 50,000 or more, 26 were supplied wholly or in part by private companies, but some of these are partly supplied by municipal works. In the absence of exact figures the *Return* says "it seems likely that about two-thirds of the total population of the country [England and Wales] is now supplied with water by municipal bodies." A report made 70 years earlier showed that in 1845 most of the "large towns" having water works (only 26 or 50 had any part of their areas supplied by authorized undertakings) were dependent on private companies. The foregoing figures relate to the number of places supplied. As to the number of works and their ownership, the *Return* states: "Particulars are given of the undertakings of 786 local authorities, the Metropolitan Water Board and 34 other joint authorities, 200 companies with statu-

in which the terpsichorean element was coördinated to the drama and the music. In the production of Puccini's *Madama Butterfly* the rôle of Cio-Cio-San was sung by a native Japanese soprano, Mme. Tamaki-Miura. The conductors were Moranzoni and Jachia for the operas and Schmid for the ballets. The singers included: Mmes. Vilani, Teyte, Lyne, Gay, and Leveroni; and Messrs. Martin, Andres, Baklanov, Ananian, Chalmers, and Mardones.

After a little more than a year's activity the Century Opera Company abruptly terminated its season in Chicago in January, and soon afterwards disbanded. From among the members of the defunct organization M. and S. Aborn, the former directors of the Century, formed a new company with which they gave opera in English in several of the larger cities. Owing to conditions arising from the war and to serious damage caused by a great storm the New Orleans Opera Company decided to abandon its usual season.

EUROPEAN COUNTRIES

GERMANY. A decision of vital importance to German composers and publishers was handed down by the Supreme Court in the case of a lawsuit instituted over two years ago by the *Genossenschaft Deutscher Tonsetzer* against some 50 publishers. The dispute turned upon the question of royalties paid by the manufacturers of mechanical instruments. The composers had reserved to themselves all rights in this matter, and the publishers claimed equal rights. In every instance the courts declared the publishers entitled to half the royalties thus paid by manufacturers. The final decision of the Supreme Court not only confirmed the verdict of the lower courts, but even went so far as to declare null and void all existing contracts between publishers and composers. One rather strange effect of the war was the comparative neglect of contemporary composers and an unusual interest manifested in the works of the classic masters. Thus Berlin heard no less than 15 performances of Beethoven's *Ninth Symphony* and four complete cycles of that master's symphonies, while the record for the production of Brahms's works is not far behind. General Intendant von Huelsen of the Berlin Royal Opera arranged a series of concerts in various Belgian cities by the forces of the Berlin, Munich, Dresden, and Stuttgart institutions, chiefly for the benefit of wounded soldiers. Before crowded houses the Berlin Philharmonic, under Camillo Hildebrandt, gave a six-day Beethoven Festival, during which all the symphonies, the violin concerto, the piano concertos in E $\flat$ and C, and the Triple Concerto were performed. In spite of the war the centenary of the birth of Robert Franz was observed everywhere, but especially at Halle. The celebration at Schmalkalden of the hundredth birthday of Carl Wilhelm, the composer of *Die Wacht am Rhein*, naturally became the occasion of an immense patriotic demonstration. Many of the smaller opera houses that had closed their doors at the beginning of the war resumed operations. But throughout the empire very few novelties were produced, whereas a number of older operas were revived. Among these revivals Marschner's *Hans Heiling*, Méhul's *Josef*, and the earlier Mozart operas were received with unexpected interest. Schilling's *Mona Lisa* had its *première* at Stuttgart,

and met with only a *succès d'estime*, while subsequent performances at Vienna and Berlin barely escaped a fiasco. Leo Fall scored an enormous success at Berlin with a new light opera, *Der künstliche Mensch*, and three weeks later almost duplicated this success with his latest work, *Die Kaiserin*. Of numerous choral works only one made a deep impression, Max Bruch's *Heldenfeier*, on a text by his daughter Margarethe. This work, produced by the Berlin Philharmonic Chorus under Siegfried Ochs, is ranked with the masterpieces of the composer's early manhood. The first performance of a new work by Richard Strauss is always an event of the first magnitude. Under the composer's personal direction the *première* of his *Alpensymphonie* took place at Berlin on October 28th. As usual in the case of a Strauss *première*, the first reports are conflicting, but upon the majority of the critics the new work made a decidedly favorable impression, being praised as lucid, well developed, and euphonious. It is hailed with joy as marking a return to the earlier style of the great tone-poems, which, after all, remain Strauss's highest achievement.

ENGLAND. Many concerts were given for the various war funds and charities, and considerable sums were realized. Earlier in the year only works by native composers were heard, but audiences soon tired of this fare. (See section *General News*.) The regular season of grand opera was omitted. Instead, Vladimir Rosing announced a season of Russian, Italian, and French opera at Hammerstein's Opera House. At the opening night Tschaikowsky's *Pique Dame* had its first performance in England. In spite of excellent artists the undertaking collapsed at the end of the first week. More successful was a season of opera in English under the direction of Robert Courtneidge and Thomas Beecham at the Shaftesbury Theatre, which met with such favor that the original season of six weeks was extended indefinitely.

FRANCE. Musical activities were practically paralyzed by the war, for none of the belligerent countries had so many of its musicians at the front as France. On the plea of unfairness toward the strongest men, who were giving their services to their country, the prize competitions at the Conservatoire were restricted to women. In order to avoid further importation of the German editions of the classics, French publishers began to bring out the German masterpieces in French editions. Thus there were published during the year Mozart's *Sonatas* revised by Saint-Saëns, Beethoven's *Sonatas* by Dukas, some works of Chopin by Debussy, and some of Mendelssohn by Ravel. In December the Lamoureux concerts were resumed. The Grand Opéra, whose doors had been closed for more than 18 months, began to give performances twice a week. But no complete operas were given, only single acts. The Opéra Comique resumed full performances. Owing to its limited personnel, however, only six works found their way into the repertoire.

Bibliography. The war prevented the importation of foreign books, with the exception of those printed in England. Among the more important English and American books are the following:

C. van den Borren, *The Sources of Keyboard Music in England* (London), a detailed account, drawn from authentic sources, of the

virginal and the development of virginal music from the fourteenth century on, showing also the influence of the instrument upon the growth of the various dance forms; H. Brower, *Piano Mastery* (New York), valuable as a record of the views of 30 eminent pianists on various problems of technic and interpretation; A. Dolmetsch, *The Interpretation of the Music of the Seventeenth and Eighteenth Centuries* (London), very valuable because of numerous quotations from writers of those centuries explaining the proper performance of the music of their time; J. A. Fuller-Maitland, *The Consort of Music: A Study of Interpretation and Ensemble* (London), an adequate historical account, laying chief stress on chamber music; F. Salvador-Daniel, *The Music and Musical Instruments of the Arab* (New York), a good treatise on both theory and practice; E. van der Straeten, *The Violoncello and the Viols* (London), authoritative and complete, with detailed account of all famous makers and appendix giving sketches of principal performers; C. van Vechten, *Music after the Great War, and other Studies* (New York), a full account and explanation of the principles of futurist music from the standpoint of an admirer.

MUTUAL WELFARE LEAGUE. See *PENOLOGY*, Osborne and Sing Sing.

NARES, SIR GEORGE STRONG. English naval officer and explorer, died Jan. 15, 1915. He was born in 1831, and entered the navy in 1845. In 1873 he commanded the *Challenger* in deep sea expeditions, and in 1875 was in command of the Arctic expedition of the *Alert* and *Discovery*, which gained a point beyond 83° north. From 1879-86 he was professional officer of the board of trade. He was made vice-admiral in 1892.

NATAL. Formerly a British colony; a province of the Union of South Africa since the formation of that state May 31, 1910. The area (including Zululand) is 35,290 square miles; the population (1911 census), 1,194,043. Whites numbered 98,114, Indians and other Asiatics 133,439, and natives 962,490 (including 9092 mixed and other colored). The capital is Pietermaritzburg, which had in 1911 30,555 inhabitants, of whom 14,737 were white; Durban had 69,187 inhabitants, of whom 31,783 were white. Immigrants in 1912, 25,202; emigrants, 14,433. Education (excepting higher education, which is under the control of the Union government) is directed by the provincial administration. At government and inspected schools in 1913, 17,093 white pupils were in regular attendance; at government high and preparatory schools, the average attendance was 893. About 1500 pupils attend private schools. At the government-aided schools for natives, there was an enrollment of 20,098 in 1913, and at the government-aided schools for Indians, 3967.

At the end of 1912, 8,450,000 acres of land had been alienated, besides 2,310,000 conditionally alienated. These figures are exclusive of about 4,500,000 acres granted and leased in Zululand and the northern territories. The principal agricultural products are corn, tea, sugar, and tobacco. In 1913, sheep numbered 2,031,146, and goats 1,067,192, as compared with 1,519,258 and 989,274 in 1911; horses in 1911 numbered 75,567, cattle 456,087, mules 15,602, asses 28,018, swine 110,332, and ostriches 4111. There are extensive mineral resources. The output of coal in 1912 was 2,765,068 tons, and in 1913 2,898,

726 tons. A whaling industry is carried on at Durban. In 1913, 1344 whales were killed and landed. The whaling output in 1912 and 1913, respectively, was 6666 and 8024 tons of oil, 2000 and 1644 tons of fertilizer, and 50 and 38 tons of whalebone.

NATIONAL ACADEMY, EXHIBITIONS OF. See *PAINTING AND SCULPTURE*.

NATIONAL ACADEMY OF DESIGN EXHIBITION. See *PAINTING AND SCULPTURE*.

NATIONAL ANTI-TUBERCULOSIS ASSOCIATION. See *CHARITIES*.

NATIONAL ASSOCIATION OF JEWISH SOCIAL WORKERS. See *CHARITIES*.

NATIONAL ASSOCIATION OF MANUFACTURERS. See *EMPLOYERS' ASSOCIATIONS*, section so entitled.

NATIONAL BANKS. For information regarding the Federal Reserve System, the reader should consult *BANKS AND BANKING*. See also references there given.

STATISTICS. According to a report of the Comptroller of the Currency, there were in the country on Sept. 2, 1915, 7613 national banks. Their aggregate resources were \$12,267,000,000. Of this sum, loans and discounts represented \$6,756,680,000; United States bonds, \$781,726,000; other bonds and securities, \$1,219,000,000; specie, \$719,843,000; legal tender notes, \$122,765,000; banking houses, furniture, and fixtures, \$279,392,000. The principal items of liabilities were: capital stock, \$1,068,863,000; surplus and undivided profits, \$1,022,596,000; national bank notes outstanding, \$718,496,000; demand deposits, \$5,426,610,000; time deposits, \$1,335,572,000; the distribution of national banks with the aggregate resources for each geographical division was as follows: New England States, 434 banks with \$960,969,000 assets; Eastern States, 1652, with \$5,095,899,000; Southern States, 1586, with \$1,355,540,000; Middle Western States, 2101, with \$3,228,558,000; Western States, 1298, with \$768,018,000; Pacific States, 535, with \$851,666,000. There were two national banks in Alaska, and five in Hawaii. The predominance of New York City as the financial centre of the country is revealed by the fact that it has 33 national banks with \$2,410,000,000 assets, or nearly 20 per cent of the total assets for the entire country.

RIGGS NATIONAL BANK OF WASHINGTON. Comptroller of the Currency Williams, and Secretary of the Treasury McAdoo, ordered the United States Treasurer to pay into the Treasury certain interest on United States bonds which had accrued to the credit of this bank as a fine of \$5000 for failure of the bank to observe banking regulations. On April 13th the bank began an injunction suit in the Supreme Court of the District of Columbia against the Comptroller, the Secretary of the Treasury, and the Treasurer of the United States to prevent them from conspiring against the bank, from carrying out this order, and from demanding special reports. In answer to this the Comptroller alleged that the bank had encouraged speculation, had itself engaged in stock speculations, and other violations of the law. He showed that officials had admitted borrowing from the bank on "dummy" notes. The bank in turn sought to enlist the sympathetic support of other national banks on the ground that the administration had been unsympathetic and unjust. The case assumed great importance, being taken up by President

Wilson, with the Departments of Justice, Treasury, and Post Office, and with the cabinet. Louis D. Brandeis and Samuel Untermyer became counsel for the government and its officials, and ex-Senator Bailey of Texas for the bank. The case was heard before Justice McCoy in May. The decision rendered May 22nd upheld the administration, finding that the bank had persistently violated the law. It found nothing to impugn the good faith of the government officials, and hence the injunctions sought were denied, except as to the fine.

INTEREST RATES. On October 27th, Comptroller of the Currency Williams addressed to each national bank a circular in which he alleged that national banks were charging usurious rates of interest. In November, the Executive Committee of the National Bank Section of the American Bankers' Association protested against this circular. The committee held that the practice complained of was not general, but was confined to certain sections of the country, and that in fact national banks loan millions each year at much less than the legal rates. To this, in turn, the Comptroller made a vigorous reply, citing evidence of the practices complained of. He declared that reports in his office showed that some national banks were loaning small sums at rates ranging from 50 per cent to 2400 per cent a year, and were exacting ruinous rates on much larger sums. The evil of usury, he said, was not confined to any section of the country, but was greatest in the West, Southwest, and Northwest, especially in agricultural communities. In comment on this, it was shown by bankers that the dividends paid by all national banks in 1914 equaled 11.37 per cent; and that those of State banks equaled 10.02 per cent; and of trust companies 12.70 per cent.

NATIONAL CITY BANK. See **FINANCIAL REVIEW**, *American International Corporation*.

NATIONAL COMMITTEE FOR PREVENTION OF BLINDNESS. See **CHARITIES**.

NATIONAL CONFERENCE ON MARKETING AND FARM CREDITS. See **AGRICULTURAL CREDIT**.

NATIONAL COUNCIL OF INDUSTRIAL DEFENSE. See **EMPLOYERS' ASSOCIATIONS**, section so entitled.

NATIONAL DEFENSE. See **MILITARY PROGRESS**.

NATIONAL FEDERATION OF REMEDIAL LOAN ASSOCIATIONS. See **LOAN SHARKS**.

NATIONAL FORESTS. During the year 12 national forests were reduced in area. Cer-

tain inter-forest transfers were made involving three national forests, and the Zuni National Forest in Arizona and New Mexico was consolidated with the Manzano National Forest. There are now 162 national forests embracing 184,240,596 acres, of which area approximately 89 per cent is public land. For information in regard to irrigation projects during the year, see **IRRIGATION**. For details in regard to public lands of Alaska see the article **ALASKA**. See also **FORESTRY**.

NATIONAL GUARD. See **MILITARY PROGRESS**, *United States*; and **MILITIA**.

NATIONAL METAL TRADES ASSOCIATION. See **EMPLOYERS' ASSOCIATIONS**, section so entitled.

NATIONAL MUNICIPAL LEAGUE. See **MUNICIPAL GOVERNMENT**.

NATIONAL PROBATION ASSOCIATION. See **CHARITIES**.

NATIONAL SAFETY COUNCIL. See **WORKMEN'S COMPENSATION**.

NAVAL AERONAUTICS. See **AERONAUTICS**; and **NAVAL PROGRESS**.

NAVAL PROGRESS. Seven of the eight great naval powers of the world were involved in the European war during 1915, and the secrecy that the governments have thrown about their operations makes it exceedingly difficult to ascertain the exact facts in regard to the construction and loss of vessels; but the accompanying tables are very nearly correct, the probable errors existing chiefly in the number of submarines and destroyers built and building—particularly in the tables for Great Britain and Germany. The exact number of battleships and battle cruisers building in these countries was also unknown, as was the character of the new ships. From such information as leaked out, the new British ships were believed to be battle cruisers of 32 knots speed; though 4 battleships were ordered in 1914, these may have been changed to battle cruisers. All British battleships in hand at the end of 1913 were practically completed at the end of 1915, and many were in service. While the Germans were not making equally rapid progress in shipbuilding, they apparently were concentrating their efforts upon those which were launched or laid down before the war broke out, and there was no report that they had begun any new ones of large size. The construction of large ships seemed to be going on at the usual rate in France and Italy, and at a reduced rate in Russia and Austria. In Japan, the very slow work of the previous two or three years had been somewhat accelerated.

NUMBERS AND TONNAGE

Of Vessels Completed and Under Construction in the Eight Greatest Navies of the World on January 1, 1916

GREAT BRITAIN				GERMANY					
	Vessels Built			Vessels Building			Vessels Building		
	No.	Tons		No.	Tons	No.	Tons	No.	Tons
Battleships (Dreadnought type) . . .	33	766,450	4	120,000	17	391,033	3	90,000	
Battleships (Pre-dreadnought)	27	887,200			19	230,058			
Battle cruisers	10	217,800	6*	198,000	5	122,040	2*	64,000	
Coast defence ships	13*	20,600	10*	18,000					
Armored cruisers	27	323,050			8	28,679			
Fast cruisers (23 knots or faster) . .	45	183,830	8*	45,400	13	51,730	6	30,936	
Other cruisers	34	225,650			12	48,772			
Destroyers	233	179,810		(1)	156	98,663		(1)	
Torpedo boats	46	11,618			8	1,264			
Submarines	111*	61,132	40*	35,000	50*	30,000	60*	40,000	
	579	2,877,140	68	416,400	283	997,289	71	224,936	

Total: Ships, 647; tonnage, 2,798,540.

Total: Ships, 354; tonnage, 1,222,175

UNITED STATES

	Vessels Built		Vessels Building		Vessels Built		Vessels Building	
	No.	Tons	No.	Tons	No.	Tons	No.	Tons
Battleships (Dreadnought type)....	12	276,650	5	158,800	7	161,672	9	244,000
Battleships (Pre-dreadnought)....	20	277,282	..	.....	15	227,191	..	.....
Battle cruisers .....	..	.....	..	.....	..	.....	..	.....
Coast defence ships	4	12,900	..	.....	2	19,530	..	.....
Armored cruisers	15	186,545	..	.....	17	179,359	..	.....
Fast cruisers (23 knots or faster)...	8	11,250	..	.....	8	21,648	6	89,000
Other cruisers	8	26,060	..	.....	4	16,657	..	.....
Destroyers	57	41,417	11	12,230	89	40,928	..	(1)
Torpedo boats	17	8,041	..	.....	132	13,144	..	.....
Submarines	38	.....	86	.....	95	45,784	..	(1)
	174	885,145	52	171,030	364	725,913	15	288,000

Total: Ships, 226; tonnage, 1,006,175.

Total: Ships, 379; tonnage, 1,008,913.

JAPAN

	Vessels Built		Vessels Building		Vessels Built		Vessels Building	
	No.	Tons	No.	Tons	No.	Tons	No.	Tons
Battleships (Dreadnought type)....	2	41,600	4	125,200	5	114,500	2	45,000
Battleships (Pre-dreadnought)....	12	181,294	..	.....	..	.....	4	180,000
Battle cruisers	2	55,000	2	55,000	7	99,578	..	.....
Coast defence ships	1	4,126	..	.....	1	8,880	..	.....
Armored cruisers	13	137,672	..	.....	5	56,155	..	.....
Fast cruisers (23 knots or faster)...	5	25,450	..	.....	5	32,605	6	42,510
Other cruisers	8	31,548	..	.....	2	13,462	..	.....
Destroyers	54	21,709	10	10,000	118	66,718	17*	23,694
Torpedo boats	46	4,145	..	.....	19	2,682	..	.....
Submarines	13	2,672	2	1,200	40*	13,000	15*	11,000
	156	505,216	18	191,400	202	407,580	44	252,204

Total: Ships, 174; tonnage, 686,616.

Total: Ships, 246; tonnage, 659,784.

ITALY

	Vessels Built		Vessels Building		Vessels Built		Vessels Building	
	No.	Tons	No.	Tons	No.	Tons	No.	Tons
Battleships (Dreadnought type)....	6	130,646	4	112,000	4	80,040	4	98,000
Battleships (Pre-dreadnought)....	7	82,305	..	.....	6	74,613	..	.....
Battle cruisers .....	..	.....	..	.....	..	.....	..	.....
Coast defence ships .....	..	.....	..	.....	4	30,136	..	.....
Armored cruisers	6	50,119	..	.....	3	18,503	..	.....
Fast cruisers (23 knots or faster)...	3	10,334	1	5,000	4	13,536	3	14,400
Other cruisers	2	6,240	2	5,120	3	8,564	..	.....
Destroyers	41	20,980	16	16,800	20	10,352	6	4,800
Torpedo boats	70	11,856	..	.....	67*	13,095	..	.....
Submarines	19	7,200	10*	9,420	18*	9,000	..	(1)
	154	319,680	33	148,340	129	257,839	13	117,200

Total: Ships, 187; tonnage, 468,020.

Total: Ships, 142; tonnage, 375,039.

Vessels more than 20 years old are excluded from consideration in the table unless rebuilt within 10 years. No cruisers of less than 1500 tons are included.

Battleships are vessels in which the properties of offense and defense are developed to the highest degree. Battle cruisers are vessels which carry a battery of calibre equal to that of contemporary battleships but the armor protection may be less. The speed is much greater than that of battleships.

Armored cruisers have much smaller guns than contemporary battleships; their speed is somewhat greater and their armor much thinner.

Coast defense vessels consists of armored craft of less than 10,000 tons; and of all armored vessels that can not fight efficiently at sea.

Torpedo boats differ from destroyers in being smaller, usually slower, and in having lighter and fewer guns.

The submarine tonnage of the United States would add considerably to its total; the figures are omitted in deference to the wishes of the Navy Department.

* Exact numbers and tonnage in doubt; figures given are based upon reliable information and believed to be nearly correct.

The tables given in the YEAR BOOK for 1914 show the condition of each navy a month before the war began. By comparison it will be seen that, while 13 old battleships had disappeared from the lists of the British navy, owing to losses in war or because they had reached the age of 20 years, the number of dreadnoughts had increased from 20 to 33. In the German navy, of 9 armored cruisers but 3 were left. The British navy had lost an equal number. As the armored cruiser is a discredited type, these losses were unimportant.

The naval situation, as regards the sea strength of the principal powers, remained unchanged in 1915. Great Britain was far in the lead—almost equal to any three of the others; Germany was second; France and the United States were practically tied for third place, but this was due to the fact that the submarine tonnage for the latter is omitted—moreover, the large number of small torpedo boats adds little to France's strength, but considerably to her tonnage and numbers; Japan is fifth; Russia, sixth; Italy, seventh; and Austria, eighth.

WARSHIP LOSSES

Of the various navies from Aug. 1, 1914, to Jan. 1, 1916.

GREAT BRITAIN				
Name of Ship	Type	Tonnage	How Lost	Date
Audacious	B.S.D.	25,000	M	27-10-14
Bulwark	B.S.	15,000	Ex. A	26-11-14
Formidable	B.S.	15,000	S-T.	1-1-15
Irresistible	B.S.	15,000	M.	18-3-15
Majestic	B.S.	14,900	T.	27-5-15
Ocean	B.S.	12,950	M.	18-3-15
Goliath	B.S.	12,950	T.	12-5-15
Triumph	B.S.	11,800	S-T.	26-5-15
Warrior	A.C.	13,550	M.	5-9-14
Good Hope	A.C.	14,100	G.	1-11-14
Monmouth	A.C.	9,800	G.	1-11-14
Aboukir	A.C.	12,000	S-T.	22-9-14
Cressy	A.C.	12,000	S-T.	22-9-14
Hogue	A.C.	12,000	S-T.	22-9-14
Argyll	A.C.	10,850	W.	28-10-15
Hawke	C.	7,350	S-T.	13-10-14
Hermes	O.	5,600	S-T.	31-10-14
Amphion	O.	8,500	M.	5-8-14
Pathfinder	C.	8,000	S-T.	5-9-14
Pegasus	C.	2,135	G.	20-9-14
Maori	D.	1,035	M.	7-5-15
Lynx	D.	935	M.	9-8-15
Recruit	D.	385	S-T.	1-5-15
Speedy	G.B.	810	M.	3-9-14
Niger	G.B.	810	S-T.	11-11-14
No. 10	T.B.	215	S-T.	10-6-15
No. 12	T.B.	215	S-T.	10-6-15
No. 96	T.B.	130	Col.	1-11-15
D-2	S.	550	Miss.	.....
D-5	S.	550	M.	3-11-14
A-E-1	S.	725	F.	14-9-14
A-E-2	S.	725	G (f)	30-4-15
E-3	S.	725	M.	18-10-14
E-7	S.	725	T (f)	-9-15
E-10	S.	725	Miss.	.....
E-13	S.	725	W.	.....
E-15	S.	725	W.	18-4-15
E-20	S.	800	T (f)	5-11-15
Fishguard II	Tr. Sh.	6,010	F.	18-9-14
Princess Irene	Aux. C.	5,934	Ex. A.	27-5-15
Clan McNaughton	Aux. C.	4,985	W.	3-2-15
Rohilla	Aux. C.	7,400	M.	30-10-14
Viknor	Aux. C.	5,386	W.	14-1-15
Bavaro	Aux. C.	5,248	S-T.	10-3-15
India	Aux. C.	7,900	S-T.	8-8-15
Tara	Aux. C.	6,322	S-T.	5-11-15
Oceanic	Tran.	18,000	Col.	8-9-14
Royal Edward	Tran.	11,117	S-T.	14-8-15
Marquette	Tran.	7,057	T-S (f)	11-15
Ramazan	Tran.	.....	S-G.	19-9-15
Ramsey	Patr.	.....	.....	8-8-15

Total: 51 ships; 825,854 tons

FRANCE				
Name of Ship	Type	Tonnage	How Lost	Date
Bouvet	B.S.	12,205	M	18-3-15
Gambetta	A.C.	12,000	S-T.	27-4-15
Dague	D.	720	M.	24-2-15
Mousquet	D.	298	G.	28-10-14
No. 219	T.B.	87	G (f)	1-15
No. 338	T.B.	97	Col.	9-10-14
No. 347	T.B.	98	Col.	9-10-14
Curie	S.	398	G.	12-14
Saphir	S.	390	W.	17-1-15
Mariotte	S.	522	G (f)	26-7-15
Turquoise	S.	390	G.	1-11-15
Zelée	G.B.	680	G.	28-10-14
Casabianca	Min.	495	M.	4-6-15

Total: 13 ships; 28,380 tons.

RUSSIA				
Name of Ship	Type	Tonnage	How Lost	Date
Pallada	A.C.	7,775	S-T.	11-10-14
Jemchug	C.	8,050	T.	28-10-14
Pustichin	D.	826	G.	30-10-14
Donetz	G.B.	1,200	G.	29-10-14
Kubanetz	G.B.	1,200	G.	28-10-14
Slivutsh	G.B.	960	G.	16-8-15
Yenesei	Min.	2,926	S-T.	6-6-15
Prut	Min.	5,500	G.	29-10-14
Oleg	Min.	1,125	G.	24-12-14
Athos	Min.	1,743	G.	24-12-14
Ryazan	Tran.	3,522	Cap.	6-8-14

Total: 11 ships; 29,327 tons.

JAPAN				
Name of Ship	Type	Tonnage	How Lost	Date
Takachiho	C.	8,650	T.	17-10-14
Shirotaji	D.	880	W.	4-9-14
(Unknown)	T.B.	(f)	M.	(f)
No. 33	T.B.	110	M.	11-11-14

Total: 4 ships; 4,140 tons.

ITALY				
Name of Ship	Type	Tonnage	How Lost	Date
Benedetto Brin	B.S.	13,215	Ex. A.	28-9-15
Amalfi	A.C.	9,958	S-T.	7-7-15
Giuseppe Garibaldi	A.C.	7,284	S-T.	18-7-15
Turbine	D.	880	G.	24-5-15
Medusa	S.	800	S-T.	17-6-15
(f)	S.	(f)	A.B.	(f)

Total: 6 ships; 31,037 tons

Total losses of Entente Allies: 85 ships; 418,238 tons.

GERMANY				
Name of Ship	Type	Tonnage	How Lost	Date
Moltke (f)	B.C.	22,640	S-T.	8-15
Pommern	B.S.	12,997	S-T.	2-7-15
Blücher	A.C.	15,500	G.	24-1-15
Gneisenau	A.C.	11,600	G.	8-12-14
Scharnhorst	A.C.	11,600	G.	8-12-14
Yorck	A.C.	9,050	M.	8-11-14
Prinz Adalbert	A.C.	9,050	S-T.	28-10-15
Friedrich Karl	A.C.	8,858	M.	12-12-14
Karlsruhe	C.	4,900	↑	11-14
Magdeburg	C.	4,478	G.	27-8-14
Augsburg	C.	4,280	G.	7-8-14
Mainz	C.	4,280	G.	28-8-14
Köln	C.	4,280	G.	28-8-14
Emden	C.	3,592	G.	9-11-14
Dresden	C.	3,592	G.	14-8-15
Nürnberg	C.	3,396	G.	8-12-14
Königsberg	C.	3,348	G.	4-7-15
Leipzig	C.	3,200	G.	8-12-14
Undine	C.	2,672	S-T.	7-11-15
Ariadne	C.	2,618	G.	28-8-14
Hela	C.	2,040	S-T.	18-9-14
Geier	C.	1,630	I.	8-11-14
Kormoran	C.	1,630	Ex. C	6-11-14
(Three f)	(f)	(f)	G.	17-8-15
Eber	G.B.	1,000	I.	9-14
Itia	G.B.	900	Ex. C.	6-11-14
Luets	G.B.	900	Ex. C.	6-11-14
Tiger	G.B.	900	Ex. C.	6-11-14
Jaguar	G.B.	900	Ex. C.	6-11-14
Wissman	G.B.	200	Cap.	20-8-14
Tsing-tao	G.B.	168	I.	17-8-14
Vaterland	G.B.	168	I.	17-8-14
V-186	D.	750	G.	.....
S-187	D.	650	G.	28-8-14
S-106	D.	675	G.	.....
S-126	D.	487	S-T.	6-10-14
S-119	D.	420	G.	17-10-14
S-118	D.	420	G.	17-10-14
S-117	D.	420	G.	17-10-14
S-115	D.	420	G.	17-10-14
S-90	D.	400	W.	20-10-14
S-124	D.	350	Col.	23-11-14
(G-196, type)	D.	689	Sk.	26-7-15
Unknown	D.	(f)	Sk.	22-8-15
Taku	D.	280	G.	6-11-14
Eight boats	D.	(f)	G.	17-8-15
U-51	S.	800	G.	17-7-15
U-29	S.	800	Miss.	3-15
U-27	S.	800	Miss.	3-15
U-18	S.	750	Ram.	23-11-14
U-15	S.	250	Ram.	9-8-14
U-14	S.	300	Sk.	16-6-15
U-12	S.	250	Ram.	10-3-15
U-8	S.	187	Ram.	4-3-15
U-3	S.	250	Ram.	9-8-14
A-2	T.B.	150	G.	1-5-15
A-6	T.B.	150	G.	1-5-15
Berlin	Aux. C.	17,324	I.	16-11-14
Kronpr. Wilhelm	Aux. C.	14,705	I.	20-4-15
Kais. Wilh. der Gros.	Aux. C.	14,350	G.	27-8-14
Cap. Trafalgar	Aux. C.	9,854	G.	14-9-14
Prinz Eitel Friedr.	Aux. C.	8,865	I.	7-4-15
Patagonia	Aux. C.	(f)	I.	16-11-14
Kormoran II.	Aux. C.	3,508	I.	15-12-14
Navarra	Aux. C.	3,641	G.	11-11-14
Bethania	Aux. C.	4,848	Cap.	9-14
Sorenewald	Aux. C.	2,414	Cap.	12-9-14
Gracia	Aux. C.	1,697	Cap.	10-14
Ito	Aux. C.	165	G.	9-14

Name of Ship	Type	Tonnage	How Lost	Date
Meteor	Aux. C.	3,618	Ex.C.	8-8-15
Komet	Tel.	.....	Cap.	16-10-14
Koenigin Luise....	Min.	948	G.	5-8-14
Albatross	Min.	.....	W.	2-6-15
Ruahn	Min.	.....	Ex.C.	6-11-14
Macedonia	Sup.	4,347	Cap.	4-15
Moewe	Surv.	650	G.	9-8-14
Planet	Surv.	650	G.	.....
Karnac	Trans.	4,437	I.	11-14
Ophelia	Hosp.	1,158	Cap.	17-10-14
Locksun	Tend.	1,020	I.	8-11-14

Total: 89 ships; 265,204 tons.

AUSTRIA

Name of Ship	Type	Tonnage	How Lost	Date
Kaiserin Elisabeth .	C.	4,000	Ex.C.	6-11-14
Zenta	C.	2,300	G.	16-8-14
Beethoven	Aux. C.	2,069	M.	17-12-14
(Unknown)	G.B.	.....	Sk.	24-5-15
No. 19	T.B.	78	M.	17-8-14
(Unknown)	T.B.	.....	M.	.....
(Unknown)	T.B.	.....	M.	.....
(Unknown)	S.	.....	G.	19-10-14
U-11	S.	860	A.B.	1-7-15
U-12	S.	1,000	S.T.	11-8-15
U-3	S.	300	G.	18-8-15

Total: 11 ships; 10,807 tons.

TURKEY

Name of Ship	Type	Tonnage	How Lost	Date
Mesudich	B.S.	10,000	S.T.	18-12-14
Barbarossa	B.S.	9,900	S.T.	9-8-15
Medjidieh	C.	3,432	M.	3-4-15
Berk-i-Satyet	G.B.	725	M.	29-4-15
Pelenk-i-Deria	G.B.	775	T.	28-5-15
Burak Reis	G.B.	510	Sk.	1-11-14
(1 of same type) ..	G.B.	510	M.	12-14
Yar Hissar	D.	284	S.T.	6-9-15
Dhair Hissar	T.B.	97	W.	17-4-15
Carmen	Tran.	4,424	S.T.	24-10-15
Two others	Tran.	(?)	S.T.	5-15
Besemialien	Tran.	(?)	G.	14-11-14
Bachriachmar	Tran.	(?)	G.	14-11-14
Mediat Pasha	Tran.	(?)	G.	14-11-14

Total: 15 ships; 30,657 tons.

Total losses of Teutonic Allies: 115 ships; 806,668 tons.

Abbreviations used in foregoing table:

A.B.	Destroyed by bomb from air craft.
A.C.	Armored Cruiser.
Aux. C.	Auxiliary Cruiser (armed merchant ship).
B.C.	Battle Cruiser.
B.S.	Battleship, old type.
B.S.D.	Battleship, Dreadnought type.
C.	Cruiser.
Cap.	Captured.
Col.	Sunk by collision.
D.	Destroyer.
Ex.A	Explosion, accidental.
Ex.C.	Vessel blown up to avoid capture.
F.	Foundered.
G.	Destroyed by gunfire.
G.B.	Gunboat.
Hosp.	Hospital ship.
I.	Interned in a neutral port.
M.	Sunk by a mine.
Min.	Minelayer.
Miss.	Missing, fate unknown.
Patr.	Patrol boat.
Ram.	Rammed and sunk.
S.	Submarine.
S.G.	Destroyed by gunfire from a submarine.
Sk.	Sunk; exact details unknown.
S.T.	Torpedoed by a submarine.
Sup.	Supply vessel.
Surv.	Surveying vessel.
T.	Torpedoed (not by a submarine).
T.B.	Torpedo boat.
Tel.	Telegraph ship.
Ten.	Tender.
Tran.	Transport.
Tr. Sh.	Training ship.
W.	Wrecked.
W.C.	Run ashore to avoid capture.

UNITED STATES NAVY. *Preparedness and New Programme.* What might happen to the United States, if suddenly called upon to defend herself, has been clearly shown by the war operations of the great European struggle. When passion and self-interest act together, might is successful, whether right or not. The same guaranties of neutrality were given to Switzerland, Belgium, and Luxemburg. But neither guaranties, abstract right, peaceful inclination, absence of offense, nor any other of the supposed shields for righteous nations defended Luxemburg or Belgium from the invader. Switzerland escaped solely because she quickly mobilized an army of 250,000 men and prepared to mobilize 250,000 more.

A student of Chinese history may learn much that is of use to a citizen of the United States. That great and populous country has a lengthy sea coast like our own. It has much wealth in the aggregate, though the masses are poor. As in the United States, the trade of a soldier or sailor is looked down upon. Money is spent for all things but defense. "Preparedness" has as yet no Chinese equivalent in language, thought, or fact. Politicians quarrel over offices and the Chinese form of "pork barrel." No offenses against foreign nations are committed by the Chinese government; and the offenses of individuals are apologized for and reparation proffered. China wants and has always wanted peace. Not only has she desired to escape war, but she has never made any suitable preparations to defend herself if war were forced upon her. What is the result? England annexed a portion of her southwestern domain and the great seaport of Hongkong; France seized and appropriated a vast area in the south; the Russian frontier has been steadily advancing at the expense of China for a century; Japan has deprived her of a kingdom and half a dozen principalities; Germany forced the cession of a fine port and the surrounding territory; and the whole country would have been divided into "Spheres of Influence" by the Great Powers but for their incompatible jealousies and the protests of the United States.

These facts were beginning to be understood by the American people and government and this has resulted in a strong campaign for preparedness to resist aggression, defend the right, and insure national existence, aims, prosperity, and happiness against the envy and greed of the powerful. The first line of defense is the navy, and if this is preserved intact, safety is assured; combined with an adequate army, it makes the country not only safe but impregnable.

A full appreciation of the situation in 1915 caused the Navy Department to present the most extensive and far-reaching plans which have ever received official sanction in the United States. The five-year programme included in the plans provided for new construction was as follows:

SHIP CONSTRUCTION FOR FIVE YEARS

	1917	1918	1919	1920	1921	Total
Battleships	2	2	2	2	2	10
Battle cruisers	2	0	1	2	1	6
Scout cruisers	3	1	2	2	2	10
Destroyers	15	10	5	10	10	50
Fleet submarines	5	4	2	2	2	15
Coast submarines	25	15	15	15	15	85
Gunboats	2	1	0	0	0	3
Hospital ship	1	0	0	0	0	1
Ammunition ships ...	0	0	0	1	1	2

Fuel oil ships	0	1	0	0	2
Repair ship	0	0	0	1	1
Total	55	84	27	35	34

The corresponding necessary appropriations were:

New Ships.	1917	1918	1919	1920	1921
Dreadnoughts	\$15,560,000	\$26,580,000	\$37,600,000	\$37,600,000	\$37,600,000
Battle cruisers	11,158,000	11,921,500	17,500,000	17,118,500	23,460,500
Scout cruisers	6,900,000	6,850,000	10,000,000	8,650,000	10,000,000
Destroyers	10,500,000	16,900,000	10,100,000	10,800,000	13,600,000
Fleet submarines	4,425,000	5,577,500	5,487,500	4,215,000	3,400,000
Coast submarines	5,750,000	13,950,000	9,750,000	9,750,000	9,750,000
Gunboats	760,000	1,140,000	880,000	.....	380,000
Hospital ship	1,250,000	1,200,000	.....	.....	.....
Ammunition ships	.....	.....	.....	799,687	1,768,000
Fuel oil ships	700,000	655,250	.....	700,000	655,250
Repair ship	.....	.....	.....	.....	1,175,000
Total	\$57,003,000	\$84,278,750	\$90,767,500	\$89,133,087	\$101,786,750
For completion of ships previously authorized	28,369,127	20,149,000	.....	.....	.....
Total	\$85,372,127	\$104,422,750	.....	.....	.....
Aviation	2,000,000	1,000,000	1,000,000	1,000,000	1,000,000
Reserve of munitions	8,000,000	5,000,000	5,000,000	5,000,000	2,000,000
Grand Total	\$95,372,127	\$110,422,750	\$96,767,500	\$95,133,087	\$104,786,750

President Wilson recommended the adoption of the five-year programme. If Congress should assent, the grand total to be spent on the navy during the five years would be:

For 185 new ships	\$422,964,087
For continuing work on ships already authorized	48,518,127
For aviation	6,000,000
For reserve supply of munitions	25,000,000
Total for increase	\$502,482,214
For upkeep of the navy	\$515,000,000
Total for the navy for five years	\$1,017,482,214

The plans called for an increase of 250 in the number of midshipmen at the Naval Academy, and an increase in the enlisted force of 7500 sailors, 2500 apprentice seamen, and 1500 marines.

NAVAL OPERATIONS IN 1915

During the early months of the war nearly the whole of Germany's colonial possessions were surrendered to British expeditions—in the Pacific, from Australia and New Zealand; in South Africa, from the British South African Confederation. No further work of importance was left for the colonial navies. At the end of 1914, only five German war vessels were beyond the British blockade in the Baltic and at the Dardanelles. The light cruiser *Königsberg*, blockaded in the Rufiji River, was destroyed in April, 1915, by the *Severn* and *Mersey* (1200 tons, two 6-inch, and two 4.7-inch guns), built as river monitors, and purchased from Brazil when completed. The *Dresden*, which escaped from the battle of the Falkland Islands, was destroyed off Juan Fernandez on March 14th by a portion of the British squadron which took part in the Falklands battle. The internment at Norfolk, during the month of April, of the auxiliary cruisers *Prinz Eitel Friedrich* and *Kronprinz Wilhelm* left the sea clear of German armed vessels except, possibly, the *Karlsruhe*. The fate of this vessel is unknown. She was reported wrecked and blown up in November, 1914, but nothing definite has been published.

The German raids on the British coast, in

killed many non-combatants, were possibly reconnoissances in force to determine the location of the British fleet. On Jan. 24, 1915, with a squadron consisting of the *Derfflinger*, *Seydlitz*, *Moltke*, and *Blücher*, the Germans attempted a third raid or reconnoissance. Between 8 and 9

A.M. they sighted the British battle cruiser squadron composed of the *Lion*, *Tiger*, *Princess Royal*, and *New Zealand*, and immediately changed course 180° and went ahead full speed in retreat. The British squadron pursued at full speed, but it was after 9 o'clock before they got within range. In the action which followed, the German armored cruiser *Blücher* was sunk. The British battle cruiser *Lion* was injured in her machinery and fell out of the chase, and one or more of the German battle cruisers were believed to be considerably damaged.

From this time to the close of the year the vessels of the German fleet, except submarines, have remained behind their defenses. The British blockade of the coast has grown more and more effective. In September, a flotilla of British submarines broke through the mine-fields at the entrance to the Baltic and joined the Russian Baltic fleet. The combined flotillas succeeded in breaking up the trade with Sweden, which supplied large quantities of foodstuffs, iron, steel, copper, cotton, and nitrates. It is a singular and noteworthy fact that the Germans were not risking any part of their forces to keep this trade route open nor to operate against the British or Russians. Armored cruisers, old cruisers, and a few old battleships were risked in the Baltic and were lost. But experience had already taught that these vessels were of no great fighting value. It was therefore evident that the Germans were holding their main fleet in readiness for some great coup—if the opportunity ever offered.

Since January, 1915, the German navy confined its activities almost wholly to operations against commerce, that of the enemy and that of neutrals. On February 4th, the German Admiralty issued the following proclamation:

"The waters around Great Britain and Ireland, including the whole English Channel, are declared a war zone from and after Feb. 18, 1915.

"Every enemy merchant ship found in this war zone will be destroyed, even if it is impossible to avert dangers which threaten the crew and passengers.

"Also, neutral ships in the war zone are in danger, as in consequence of the misuse of neu-

Ingleside, State Industrial School at Kearney, Hospital for Tuberculous at Kearney, Nebraska Hospital for the Insane at Lincoln, Orthopedic Hospital at Lincoln, State Penitentiary at Lincoln, Nebraska Industrial Home at Milford, Soldiers' and Sailors' Home at Milford, Institute for the Blind at Nebraska City, Hospital for the Insane of Nebraska at Norfolk, Nebraska School for the Deaf at Omaha, Nebraska Reformatory, which is unlocated, Home for Dependent Children at Lincoln.

STATE GOVERNMENT. Governor, John H. Morehead; Lieutenant-Governor, James Pearson; Secretary of State, C. W. Pool; Treasurer, G. E. Hall; Auditor, W. H. Smith; Attorney-General, W. G. Reed; Superintendent of Education, A. O. Thomas; Commissioner of Insurance, W. B. Eastham—all Democrats except Thomas, Republican.

JUDICIARY. Supreme Court: Chief Justice, A. M. Morrissey; Justices, Charles B. Letton, Francis G. Hamer, Jacob Fawcett, William B. Rose, John B. Barnes, and Samuel H. Sedgwick; Clerk, H. C. Lindsay.

STATE LEGISLATURE:

	<i>Senate</i>	<i>House</i>	<i>Joint Ballot</i>
Democrats	19	61	80
Republicans	14	39	53
Democratic majority..	5	22	27

NEBRASKA, UNIVERSITY OF. A State institution for higher education, founded at Lincoln, Neb., in 1869. The total enrollment in all departments in the autumn of 1915 was 3974. Of this number, 3067 were in the colleges, and 907 in the schools and extension courses. The faculty, including teachers of all ranks, numbered 319. The professor of forestry resigned during the year, and the department was added to that of horticulture. There was established a department of poultry husbandry. The Bessey Memorial Fellowship fund was created. The permanent endowment funds of the university on Oct. 31, 1915, were \$795,820, and the annual income amounted to \$42,500. The library contained 113,933 bound volumes.

NEBRASKAN, THE. See NAVAL PROGRESS, *Naval Operations in 1915.*

NEBRASKAN CASE. See UNITED STATES AND THE WAR.

NECROLOGY. The following list contains the names of notable persons who died during 1915. The marking of names with an asterisk indicates that biographical notices will be found under names so marked in the proper alphabetical places in the YEAR BOOK.

Acker, Paul. German journalist and novelist. Died June 27; born, 1874.

* Adams, Charles Francis. American soldier, publicist, and historian.

Adams, Charles Hemenway. American editor. Died August 28; born, 1845.

* Adamson, Alfred. American naval officer.

* Adickes, Franz. German public official.

* Agliardi, Antonio. Roman Catholic cardinal.

* Albee, John. American author and poet.

* Aldrich, Nelson Wilmarth. Former United States Senator.

* Alexander, Gross. Methodist Episcopal clergyman.

* Alexander, James Waddell. Former life insurance official.

* Alexander, John White. American artist.

* Allen, Charles Julius. American soldier.

* Allen, William Frederick. American editor and engineer.

* Alverstone, Sir Richard Everard Webster, first baron. English jurist.

* Anderson, George Smith. American soldier.

Arisaka, Mariaki, Lieutenant-General Baron. Japanese soldier, inventor of a quick-firing gun. Died January 11; born, 1852.

* Armstrong, Paul. American dramatist.

Assheton, Richard. English scientist. Died October 21; born, 1863.

* Atkinson, Rev. Edward. English scholar and clergyman.

* Aubert, Marie Jacques Charles. French admiral.

Avery, Susan. American writer and suffragist. Died February 2; born, 1818.

Bacon, Henry. Former member of Congress. Died March 25; born, 1846.

* Bancroft, William H. American railroad official.

* Bard, Thomas Robert. American public official.

Barnaby, Sir Nathaniel. English naval designer.

Died June 15; born, 1829.

Batcheller, George Clinton. American manufacturer and art collector. Died January 25; born 1834.

* Bates, Lindon, Jr. American engineer.

* Bauer, Francis S. Austrian cardinal.

Beachey, Lincoln. American aviator. Died March 15; born, 1887.

Beadle, William Henry Harrison. American soldier. Died September 11; born, 1838.

* Beehler, William Henry. American naval officer and scientist.

Below, Nicholas von, Major-General. German soldier. Death reported Aug. 4.

Benedict, Wayland. American philosopher and educator. Died July 21; born, 1848.

* Benson, Richard Meux. English clergyman and writer.

Berenger, René. French statesman. Died August 30; born, 1880.

Berger, Rudolph. German opera singer. Died February 27; born, 1875.

* Bessey, Charles Edwin. American botanist and educator.

* Betbeder, Onofre. Argentine vice-admiral.

Billinghurst, Guillermo. Former President of Peru. Died June 28; born, 1860.

Birkinbine, John. American mining engineer. Died May 14; born, 1844.

* Black, John Charles. American soldier and public officer.

Blethem, Alden Joseph. American editor. Died July 11; born, 1846.

* Boardman, George Nye. American theologian and educator.

Bonal, Edmond. French historian. Died October 19; born, 1840.

Bonnett, William Whitelock. American engineer and mathematician. Died August 6.

Bookwalter, John W. American writer, philanthropist, and inventor. Died September 27; born, 1839.

Boucherville, Eugene Boucher de. Former premier of Quebec. Died September 10; born, 1822.

* Bowles, Samuel. American editor.

* Brackett, Cyrus. American physicist and educator.

Brackett, Gustavus Benson. American pomologist. Died August 2; born, 1827.

Bradbury, Joseph P. American jurist. Died July 17; born, 1838.

* Braddon, Mary Elizabeth. English novelist.

Brentano, Simon. American publisher and book seller. Died February 15; born, 1859.

Broadhead, Eva Wilder. American writer. Died August 6; born, 1870.

* Brooke, Rupert. English poet and writer.

* Brown, Thomas Jefferson. American jurist.

Brunner, Heinrich. German jurist and educator. Died August 11; born, 1839.

* Bryan, George James. American publisher and writer.

* Bucknam, Ransford B. American engineer.

Bucknell, Sir Thomas Townsend. English jurist. Died October 4; born, 1845.

Buckstone, Sir Thomas Fowell. British administrator. Died October 28; born, 1837.

* Bullen, Frank Thomas. English author and lecturer.

Bunny, John. American comedian. Died April 26; born, 1863.

* Burg, Ferdinand. Formerly Archduke Ferdinand of Austria.

* Burke, Andrew Sheridan. American soldier.

* Burke, Thomas Martin Aloysius.

* Burnam-Eddin, Mehmed. Turkish prince.

* Burr, Joseph Arthur. American jurist.

Busse-Palma, George. French lyric poet.

* Bussey, Cyrus. American soldier.

Cadogan, George Henry. fifth Earl. English noble. Died March 6; born, 1840.

Caillavet, Gaston Armand. French dramatist. Died January 13; born, 1870.

* Callender, Guy Stevens. American educator and economist.
 Cammacho, Sebastian. Mexican statesman. Died November 8; born, 1822.
 Cantori, Antonio. Italian general. Died July 26.
 Capper, Sir Thompson. English soldier. Died October; born, 1863.
 * Carden, Sir Lionel Edward Grealey. British diplomat.
 * Carr, Lucien. American archaeologist and art curator.
 * Champlin, John Denison. American author and editor of reference books.
 * Chandler, John Gorham. American soldier.
 * Cheng Tseng Ju. Chinese admiral and administrator.
 * Cheyne, Thomas Kelly. English Hebraist and Bible critic.
 * Clark, Charles Heber. American writer.
 Clark, Charles Hobart. American soldier. Died January 16; born, 1852.
 * Clouston, Sir Thomas Smith. English physician.
 * Cockrell, Francis Marion. United States Senator.
 * Codman, Robert. American bishop.
 * Coffin, Selden Jennings. American astronomer and educator.
 * Colton, Charles Henry. American bishop.
 * Coman, Katharine. American educator.
 * Comstock, Anthony. American public official.
 * Conant, Alban Jasper. American artist.
 * Conant, Charles Arthur. American economist and writer.
 * Conaty, Thomas James. American bishop.
 * Condon, Edward O'Meagher. Irish patriot.
 Constantinovitch, Constantin, Grand Duke. Russian soldier and scientist. Died June 15; born, 1858.
 * Costa, Afonso. Portuguese statesman.
 Cotton, Sir Henry (John Stedman). British administrator. Died October 21; born, 1845.
 Coy, Eliab Washburn. American educator. Died March 29; born, 1832.
 Crane, Frederick. American manufacturer and artist. Died January 25; born, 1847.
 * Crane, Walter. English painter, designer, illustrator, and writer.
 * Creelman, James. American editor and journalist.
 * Croft, William Augustus. American author.
 * Crosby, Frances Jane Van Alstyne. American hymn writer.
 Crowell, J. Foster. American engineer. Died March 29; born, 1848.
 Crowell, Thomas Young. American publisher. Died July 29; born, 1835.
 Cudahy, John. American meat packer. Died April 23; born, 1844.
 Cummings, William Hayman. English composer. Died June 13; born, 1831.
 D'Abery, Helen Burrell. American writer. Died May 3; born, 1842.
 Dana, Edith Longfellow. Daughter of Henry W. Longfellow. Died July 21.
 Daniel, Robert T. American jurist. Died May 27; born, 1858.
 Darahona, Luis Alonso. Dominican statesman. Died October 20.
 Davis, Theodore M. American Egyptologist. Died February 23; born, 1837.
 Dawbarn, Robert Hugh McKay. American physician. Died July 18; born, 1850.
 De Gourmont, Rémy. French author. Died September 28; born, 1858.
 * Delafield, Francis. American physician.
 * Delany, John Joseph. American jurist.
 * Diaz, Porfirio. Mexican statesman.
 Dickson, Samuel. American lawyer. Died May 28; born, 1837.
 Doane, William Powell. American hymn writer and composer. Died December 24; born, 1832.
 * Dodge, Arthur Pillsbury. American lawyer, inventor, and publisher.
 * Donaldson, Sir James. English scholar and educator.
 * D'Ooge, Martin Luther. American scholar and educator.
 * Dougherty, William Edward. American soldier.
 Dresser, Daniel LeRoy. American financier. Died July 11; born, 1866.
 * Du Bois, Augustus Jay. American engineer and educator.
 Duckworth, Sir James. English merchant, legislator, and traveler. Died January 1; born, 1844.
 Du Mont, Frederick. American educator. Died May 11; born, 1838.
 Dunbar, James Robert. American jurist. Died August 20; born, 1847.
 Dunn, Martha Baker. American author. Died July 22; born, 1848.
 * Durnovo, Peter Nikolalevich. Russian statesman.

* Dyche, Louis Lindsay. American zoölogist, educator, and explorer.
 Eames, Charles J. American chemist. Died March 4; born, 1831.
 * Edwardes, George. English theatrical manager.
 * Ehrlich, Paul. German scientist.
 * Elkin, John Pratt. American jurist.
 * Emerson, Luther Orlando. American composer and hymn writer.
 * Fabre, J. H. French entomologist.
 Fargo, James. American express official. Died February 8; born, 1829.
 Fields, Annie. (Mrs. James T. Fields.) Died January 5; born, 1834.
 * Finlay, Charles John. Cuban scientist and biologist.
 * Firkins, Chester. American poet. Died March 2; born, 1832.
 Fischer, Benjamin Franklin. American soldier. Died September 9; born, 1834.
 * Fitch, George. American writer.
 * Fleming, Sir Sandford. Canadian engineer and scientist. Died July 22; born, 1827.
 * Flint, Austin. American alienist.
 Flores, Antonio. Former President of Ecuador. Died August 21.
 * Forman, Justus Miles. American writer.
 * Forsyth, George Alexander. American soldier.
 * Forsyth, John McQueen. American admiral.
 * Forwood, William Henry. American soldier.
 * Fosdick, Charles Austin. American writer.
 * Fowler, Thomas Powell. American railway officer.
 * Fox, Joseph John. Roman Catholic bishop.
 Freedman, Andrew. American capitalist. Died December 4; born, 1840.
 * Freeman, Henry Blanchard. American soldier.
 Friedlander, Dr. Max. German music historian. Born, 1852.
 * Frohman, Charles. American theatrical manager.
 Frothingham, George Byron. American opera singer. Died January 19; born, 1837.
 Fuller, Frank. American governor. Died February 19; born, 1827.
 Gardner, Eugene Clarence. American author and architect. Died February 8; born, 1837.
 * Garnett, Theodore Stanford. American jurist.
 * Garrett, Mary E. American philanthropist.
 Geiger, Albert. German poet, novelist, and dramatist. Born, 1866.
 * Geikie, James. Scotch geologist and educator.
 * Gerville-Réache, Jeanne. French opera singer.
 Glasenapp, Carl Friedrich. German writer. Born, 1847.
 Goldmark, Karl. Hungarian composer. Died January 3; born, 1830.
 * Goodale, Greenleaf Austin. American soldier.
 Goodell, David Henry. American governor. Died January 22; born, 1835.
 * Goodrich, John Ellsworth. American educator.
 * Gould, Elgin Ralston Lovell. American public officer and economist.
 Grace, William Gilbert. English cricketer. Died October 21; born, 1848.
 Granger, Charles T. American chief justice. Died October 26; born, 1835.
 * Gray, John Clinton. American jurist.
 * Greene, Edward Lee. American botanist and educator.
 * Gregory, Daniel Seelye. American clergyman and editor.
 * Gregory, Eliot. American artist and writer.
 * Groton, William Mansfield. American theologian and educator.
 Guicciardini, Count Francesco. Italian statesman. Died September 1; born, 1851.
 * Guild, Curtis Jr. American editor and diplomat.
 * Guthe, Karl Eugen. American educator and physicist.
 Hall, James Knox Polk. American member of Congress. Died January 5; born, 1835.
 * Handbury, Thomas Henry. American soldier.
 Hanssen, Klaus. Norwegian physician. Died January 8; born, 1834.
 * Hardie, James Keir. English labor leader, and member of Parliament.
 Harkness, Lamon Vernon. American capitalist. Died January 17; born, 1850.
 Harland, Edward. American soldier and lawyer. Died March 9; born, 1832.
 Harper, John Wesley. American publisher. Died August 14; born, 1841.
 * Harris, Andrew Linter. American government official.
 Hartley, Sir Charles. English engineer. Died February 20; born, 1825.
 * Harty, Joseph Johnson. American educator.
 * Hawaweeny, Raphael. Syrian-Greek bishop.
 * Hazeltine, George. American lawyer and editor.

* Henderson, Charles Richmond. American sociologist and educator.
 * Hensel, William Uhler. American lawyer and educator.
 * Herreshoff, John Brown. American yacht designer.
 * Hervieu, Paul Ernest. French dramatist.
 * Heywood, Charles. American soldier.
 * Hoerber, Arthur. American painter and art critic.
 * Holder, Charles Frederick. American naturalist and writer.
 * Holmes, Joseph Austin. American geologist and public official.
 * Horn, Edward Traill. Lutheran minister.
 * Horton, Oliver Harvey. American jurist.
 * Hough, Warwick. American jurist.
 * Howe, Walter. American soldier.
 * Howland, William Le Grand. American composer and playwright. Died July 27; born, 1873.
 * Hubbard, Elbert. American author and lecturer.
 * Hubbard, Thomas Hamlin. American lawyer, soldier, and financier.
 * Huddleston, John Henry. American physician. Died October 30; born, 1864.
 * Hudson, Richard. American educator.
 * Hugo, Adele. Daughter of Victor Hugo. Died April 22; born, 1830.
 * Humphrey, Lyman Underwood. American public official.
 * Hunter, Thomas. American educator.
 * Huret, Jules. French author. Died February 14; born, 1864.
 * Huysmans, Louis. Belgian statesman. Died September 9; born, 1845.
 * Illingham, Percy. English member of Parliament. Died January 3; born, 1869.
 * Inouye, Kaoru, Marquis. Japanese statesman.
 * Isherwood, Benjamin Franklin. American rear admiral.
 * Ivins, William Mills. American lawyer.
 * Jackson, Mary Anna. Widow of Stonewall Jackson. Died March 24; born, 1831.
 * James, Frank. Last survivor of James robber gang. Died February 18; born, 1842.
 * Jamison, Charles Arbuckle. American financier. Died July 22; born, 1873.
 * Jasper, John. American educator. Died February 7; born, 1837.
 * Jay, William. American lawyer and capitalist. Died March 28; born, 1841.
 * Jenkins, Michael. American financier. Died September 7; born, 1843.
 * Jersey, Victor Albert, George Child Villiers, seventh Earl of. English nobleman. Died May 3; born, 1845.
 * Joyce, John Alexander. American soldier and writer.
 * Kane, Charles S. American jurist. Died March 29; born, 1831.
 * Kennedy, Sir William Rann. English jurist.
 * King, Henry. American editor.
 * Klein, Charles. American playwright.
 * Kollen, Gerret John. American educator.
 * Lafone, Capt. Claude A. British soldier. Killed in action in March.
 * Lamprecht, Karl. German historian.
 * Langelier, Sir Francois-Charles Stanislas. Lieutenant-Governor of Quebec. Died February 8; born, 1838.
 * Langivan, Louis Philip. Canadian archbishop.
 * Langlotz, Carl A. American educator and musician.
 * Learned, Walter. American banker and author.
 * Le Moynes, Sarah (Cowell). American actress.
 * Leschetizky, Theodor. Austrian pianist.
 * Lewis, Griffith W. Former U. S. Senator. Died August 28th; born, 1863.
 * Libby, Charles Freeman. American lawyer.
 * Little, George Thomas. American librarian.
 * Littlefield, Charles Edgar. Member of Congress from Maine.
 * Loeffler, Friedrich. German scientist.
 * Loliée, Frederic Auguste. French writer. Born, 1856.
 * Londonderry, Charles Stewart Henry Vane-Tempest-Stewart, Marquis of. English nobleman.
 * Longfellow, Edith. See Dana, Edith Longfellow.
 * Long, John Davis. American lawyer and public official.
 * Lorenzelli, Benedetto. Italian cardinal.
 * Lounsbury, Thomas Raynesford. American scholar and educator.
 * Ludlow, Nicholl. Rear admiral in the U. S. navy.
 * Lund, Troels. Danish writer.
 * Maartens, Maarten. British-Dutch novelist.
 * McCalvey, Aaron Vance. American jurist.
 * McClain, Emlin. American jurist.
 * McClure, John. American jurist. Died July 8; born, 1836.
 * McCollom, John Hildreth. American physician and educator.

* MacCord, Charles William. American draftman.
 * McCormick, Alexander Hugh. American rear admiral.
 * McCullough, John Griffith. Former Governor of Vermont.
 * Macdonald, Sir Claude Maxwell. English soldier and diplomat.
 * McGowan, John. American rear admiral. Died August 13; born, 1843.
 * McKelway, St. Clair. American editor.
 * McKendry, Carolyn Tucker. American author. Died April 1; born, 1835.
 * Mackenzie, Alexander Cameron. American educator. Died March 23; born, 1855.
 * Mackenzie, Morris Robinson Slidell. American rear admiral.
 * McPherson, Smith. American jurist.
 * Maca, Camillus. American Roman Catholic bishop.
 * Malone, Walter. American jurist and author.
 * Manatt, James Irving. American scholar and educator.
 * Manney, Henry Neuman. American rear admiral.
 * Martin, James Loren. American jurist.
 * Martin, Pierre. French inventor. Died May 23.
 * Mason, Madison Charles Butler. American negro educator. Died July 30; born, 1849.
 * Matson, Courtland Cushing. Former member of Congress from Indiana. Died September 4; born, 1840.
 * Meldola, Raphael. English chemist. Died November 6; born, 1849.
 * Merrill, Stuart. American poet.
 * Mesières, Alfred Jean. French scholar and writer.
 * Milman, Sir George Bryan. English lieutenant-general. Died January 30; born, 1822.
 * Mitchell, James Tyndale. American jurist and author.
 * Misner, Henry Rutgers. American soldier.
 * Montague, Victor Alexander. English rear admiral. Died January 30; born, 1841.
 * Moore, Edward Bruce. American public official.
 * Morehouse, James. English bishop of the Church of England. Died April; born, 1826.
 * Mulry, Joseph. American Roman Catholic priest and educator.
 * Murray, Sir James Augustus Henry. English philologist and editor.
 * Nares, Sir George Strong. English naval officer and explorer.
 * Needham, Henry Beach. American journalist.
 * Nelson, William Rockhill. American editor and publisher.
 * Neuman, Ernst. German sociologist. Died June; born, 1862.
 * Noble, Sir Andrew. English expert on artillery and explosives. Died October 22; born, 1831.
 * O'Connor, Sir Luke. English major-general. Died February 1; born, 1831.
 * O'Donovan, Jeremiah. Irish patriot.
 * O'Rourke, Jeremiah. American architect.
 * Parker, Joseph Benson. American rear admiral.
 * Parry, David MacLean. American manufacturer. Died May 12; born, 1852.
 * Parsons, John Edward. American lawyer.
 * Pausinger, Franz von. Austrian painter. Died April 6; born, 1839.
 * Payer, Julius von. Austrian explorer and painter.
 * Pegoud, Adolphe. French aviator. Died August 31; born, 1889.
 * Pelletan, Camille. French statesman. Died June 5; born, 1846.
 * Perry, Enoch Wood. American artist and public official.
 * Phelps, Thomas Stowell. Rear admiral of the U. S. navy.
 * Phillips, Andrew Wheeler. American educator and mathematician.
 * Phillips, Stephen. English poet.
 * Phyfe, William Henry Pinkney. American writer and ornithologist.
 * Pickard, Samuel Thomas. American journalist.
 * Pitou, Augustus. American theatrical manager. Died December 4; born, 1867.
 * Poor, Henry William. American banker. Died April 13; born, 1844.
 * Poppenberg, Felix. German historian.
 * Pratt, Sereno S. American financial expert.
 * Prime, Frederick. American educator and geologist.
 * Putnam, John Bishop. American publisher. Died October 8; born, 1848.
 * Putnam, Ward. American anthropologist and zoologist.
 * Quesada, Don Gonzalo de. Cuban diplomat. Died January 9.
 * Quigley, James Edward. American Roman Catholic archbishop.
 * Ream, Norman Bruce. American capitalist. Died February 9; born, 1844.

Reed, Fanny M. American singer. Died January 21; born, 1836.
 Reuter, Baron Herbert de. British head of the Reuter agency. Died April 18; born, 1852.
 * Ridder, Herman. American editor.
 Ripley, Edward Hastings. American soldier. Died September 14; born, 1839.
 * Robertson, Morgan. American writer.
 * Robinson, Edward Van Dyke. American economist and educator.
 Robinson, Tracy. American author and railroad man. Died November 20; born, 1838.
 Roche, James Connor. American war correspondent, poet, and dramatist. Died, August 24; born, 1843.
 Rockefeller, Mrs. John D. Wife of oil magnate. Died March 12; born, 1840.
 Rollins, Frank West. Former Governor of New Hampshire. Died October 29; born, 1860.
 * Ropes, Charles Joseph Hardy. American theologian.
 Rossa, O'Donovan. See O'Donovan.
 Rostrand, Eugène. French economist. Died January 20; born, 1834.
 Rothchild, Alonzo. American biographer of Lincoln. Died September 27; born, 1862.
 * Rothchild, Nathan Meyer, Baron. English financier.
 * Rucker, Sir Arthur William. Professor of mathematics and physics.
 Ruppert, Jacob. American brewer. Died May 25; born, 1841.
 * Sarrien, Jean Marie Ferdinand. French statesman.
 * Sawyer, Rollin Augustus. American Presbyterian clergyman and writer.
 * Scanlan, Lawrence. American Roman Catholic bishop.
 * Schechter, Solomon. American Hebrew scholar and educator.
 * Schindler, Solomon. American Jewish rabbi and writer.
 Schurz, Agatha. American editor, daughter of Carl Schurz. Died July 18; born, 1852.
 * Schwartz, Joost Marius Willem van der Poorten. See Maartens, Maarten.
 * Seaman, William Henry. American jurist.
 * Sedgwick, Arthur George. American lawyer and writer.
 Seligman, Henry. American banker. Died January 10; born, 1824.
 Sewell, Barton. American capitalist. Died January 7; born, 1848.
 Seymour, William Frederick Ernest. English nobleman and soldier. Died February 9; born, 1851.
 * Sharp, Benjamin. American zoologist and explorer.
 * Shattuck, Samuel Walker. American educator.
 * Sherman, Frank Asbury. American scholar and educator.
 Shipman, Andrew Jackson. American lawyer. Died October 17; born, 1857.
 * Shurtleff, Roswell Morse. American artist and illustrator.
 * Scriabin, Alexander Nikolaevich. Russian composer.
 Sloan, William Douglas. American financier and philanthropist. Died March 10; born, 1844.
 Smith, Gerrit. American inventor. Died May 4; born, 1839.
 * Spalding, Albert Goodwill. American merchant and baseball official.
 * Spanutius, Frederick W. American chemist.
 Spencer, Hiram Ladd. Canadian poet and journalist. Died October 15; born, 1835.
 * Sprague, William. American public official.
 * Staaff, Karl Albert. Swedish statesman.
 Stevenson, Matilda Cox. American ethnologist. Died June 24; born, 1855.
 Stewart, John Wolcott. Former Governor of Vermont. Died October 29; born, 1825.
 * Stillman, Thomas Bliss. American chemical engineer.
 * Stoessel, Anatole Mikailovitch. Russian soldier.
 * Story, John Patten. American soldier.
 * Story, Thomas Waldo. American sculptor.
 Streamer, Volney. American actor, writer, and librarian. Died April 14; born 1852.
 * Streett, David. American physician and educator.
 Sutton, James Fountain. American art connoisseur. Died November 24; born, 1845.
 * Sylvester, Frederick Oakes. American artist.
 Szell, Koloman. Former premier of Hungary. Died August 16; born, c. 1848.
 * Tassin, Wirt du Vivier. American chemist and metallurgist.
 * Taylor, Frederick Winslow. American engineer.
 * Taylor, John Phelps. American clergyman and educator.

* Thayer, Ezra Ripley. American scholar and educator.
 * Thomas, Jesse Burgess. American theologian.
 * Tisdall, Fitz Gerald. American educator.
 * Toll, William Edward. American bishop.
 * Tompkins, Charles Henry. American soldier.
 * Tracy, Benjamin Franklin. American soldier, public official, and financier.
 * Trudeau, Edward Livingston. American physician and authority in tuberculosis.
 * Tupper, Sir Charles. Canadian statesman.
 * Turner, Sir Joseph. English surgeon.
 * Van Amringe, John Howard. American educator.
 Van Deman, Henry E. American pomologist. Died April 28.
 Vanderbilt, Alfred Gwynne. American capitalist. Died May 7; born, 1877.
 * Van Horne, William Cornelius. Canadian financier.
 * Vannutelli, Serafino. Italian Roman Catholic cardinal.
 * Vassary, Claudius Francis. Hungarian cardinal. Died September 4; born, 1832.
 * Wadkeufel, Emile Charles. French musician and composer.
 Waller, Lewis. English actor. Died Nov. 1; born 1860.
 * Walsh, Blanche. American actress.
 * Walton, William. American artist.
 * Ward, Edgar Melville. American artist.
 Ward, Samuel Baldwin. American physician. Died June 8; born, 1842.
 * Ware, William Robert. American architect and educator.
 * Warner, Anna Bartlett. American writer.
 * Warren, Samuel Prowse. American composer and organist.
 * Washburn, George. American clergyman and educator.
 * Washington, Booker T. American negro educator.
 * Watson, William. American scientist and educator.
 * Weldner, Revere Franklin. American theologian.
 Werner, Anton Alexander von. German historical painter. Died January 5; born, 1843.
 * Whitney, Anne. American sculptor.
 * Widener, Peter A. Brown. American capitalist.
 * Wilder, Marshall P. American comedian and entertainer.
 Wilding, Anthony F. Australian tennis champion. Killed at Dardanelles, May 12.
 * Willard, Edward Smith. English sculptor.
 * Williams, John Langbourne. American banker and philanthropist.
 * Williams, Richard Richardson. American editor.
 * Witte, Count Sergius Jolovich. Russian statesman.
 Wood, Mrs. John. English actress. Died January 12; born, 1838.
 * Woodbury, Urban Andrain. American public official.
 * Woodruff, Charles Edward. American army medical officer.
 Zamor, Orestes. Former President of Haiti. Executed July 22.

NEEDHAM, HENRY BEACH. American journalist, died June 17, 1915. He was born at Castile, N. Y., in 1871, and studied for three years at Brown University. He afterwards took a law course at George Washington University. In 1894 he was admitted to the bar and practiced law for three years. He then joined the staff of the New York *Evening Post*, on which he remained until 1900, when he became assistant manager of *McClure's Magazine*. He was a member of the staff of the *World's Work* in 1905-8, and from 1904 until his death was a general writer for magazines. He served as a special commissioner to investigate labor conditions in the Panama Canal Zone in 1908, and was special correspondent for several periodicals. Mr. Needham was killed in an accident to an aeroplane piloted by Lieut. Reginald A. J. Warneford (q.v.), a British aviator who was testing, near Paris, the aeroplane in which Mr. Needham was a passenger. In some unexplained way Lieutenant Warneford lost control of the machine and it fell to the earth from a great height. He, as well as Mr. Needham, was instantly killed.

NEGRI SEMBILAN, THE (NINE STATES). A federation of states composing a state of the Federated Malay States (q.v.). The native Malays number 71,350 and are mainly engaged in agriculture in the Kuala, Pilah, and Tampin districts; the Chinese work in the tin mines. Area occupied (end of 1913) for mining, 22,894 acres; output, 4533 piculs tin and 43,537 tin ore. Area devoted to agriculture, etc., 361,922 acres, of which under rubber, 100,000 acres; rice, 32,000; coconuts, 20,000.

Seremban is the government headquarters. There are native rulers with British resident advisers.

NEIHARDT, J. G. See **LITERATURE, ENGLISH AND AMERICAN, Poetry.**

NELSON, WILLIAM ROCKHILL. American editor and publisher, died April 13, 1915. He was born at Fort Wayne in 1841, and was educated at Notre Dame University in that State. He studied law and was admitted to the bar, but did not long devote himself to that profession. He became interested in a patent for a form of pavements, which he introduced in many cities. For a time he was a cotton planter in Georgia and for another period a bridge contractor in Indiana. He then purchased the Fort Wayne *Sentinel*, but in 1880 sold it. He removed to Kansas City, where with S. E. Moore he founded the *Kansas City Star*. This paper after a hard struggle for existence came to be one of the most prosperous and influential journals in the United States, and Mr. Nelson came to be one of the great figures of American journalism. The paper was from the beginning a fearless exponent of what Mr. Nelson believed to be right. He undertook and carried through many important civic reforms in Kansas City, including improved pavements, a system of parks, and the planting of trees and shrubbery. His policy brought him into frequent conflict with the political machine and leaders, but almost invariably he was successful in bringing about what he attempted. He was several times tried for libel, but was always acquitted. In the wider field of State politics he broke up rings which practically covered Missouri and neighboring States. It is said that he refused several offices under the government, preferring to remain at the head of his paper. In 1905 he purchased the *Kansas City Times*.

NEOKHARSIVAN. See **SALVARSAN AND NEOSALVARSAN.**

NEOSALVARSAN. See **SALVARSAN AND NEOSALVARSAN.**

NEPAL. An independent Himalayan kingdom. It is bounded on the north by Tibet, on the east by Sikkim (an Indian native state), and on the south and west by British India. Estimated area, about 54,000 square miles. There are widely varying estimates of population, 3,000,000 being perhaps the most plausible figure. The capital is Katmandu, with about 50,000 inhabitants. Exports include cattle, hides and skins, gums, resins, dyes, drugs, spices, and native butter. According to Indian returns of trade, imports into India from Nepal in 1912-13 were valued at 45,498,493 rupees, and exports from India to Nepal at 22,243,544 rupees; in 1913-14, 43,275,326 rupees and 20,480,286 rupees. These figures include treasure. A British resident, with a Sepoy escort, is established at Katmandu; he does not interfere with internal affairs. The government is a military

oligarchy; the chief power rests with the prime minister. The sovereign is Tribhubana Bir Bikram, who was born June 30, 1906, and succeeded his father Dec. 11, 1911.

NETHERLANDS, THE (or HOLLAND). A constitutional monarchy of western Europe, lying between Germany and the North Sea. The capital is The Hague.

AREA AND POPULATION. The total area, including the rivers of Zeeland and South Holland, the Zuider Zee, the Dollart, and the Wadden (the shallows extending along the shores of Friesland and Groningen as far as the Dollart), based on a low-tide planimetric calculation, is 40,828.71 square kilometers (15,764 square miles). The land area by provinces, the population according to the census of Dec. 31, 1909, together with the population as calculated Dec. 31, 1914, and the density per square kilometer in 1914, are given in the table below.

	Sq. km.	1909	1914	D.
North Brabant	4,972.84	623,079	670,020	131
Gelderland	5,024.40	639,602	188,775	71
South Holland	2,931.00	1,890,744	872,625	112
North Holland	2,762.01	1,107,698	845,649	146
Zeeland	1,831.75	232,515	681,824	134
Utrecht	1,363.21	288,514	1,202,652	430
Friesland	8,220.25	359,552	1,537,568	491
Overijssel	3,354.50	382,880	382,682	178
Groningen	2,283.52	328,045	410,826	121
Drenthe	2,662.09	178,318	307,547	222
Limborg	2,194.68	332,007	239,676	88
Total	32,600.25*	5,858,175	6,339,854	185

* 12,587 square miles.

Total number of males (1909), 2,899,125; females, 2,959,050. According to nationality, the population was divided as follows: Dutch, 5,788,193; Germans, 37,534; Belgians, 18,338; French, 2645; British, 2102; Austro-Hungarians, 1223; others, 3908; not indicated, 4152. In 1909 Protestants numbered 3,334,487; Roman Catholics, 2,063,103; Jews, 106,409; persons of other faiths, 63,008; without religion, 291,168. There were (1913) 48,212 marriages, 180,257 births, and 82,583 deaths, including still-births; 6716 still-births; excess of births over deaths, 97,674. Emigrants numbered in 1913, 2330; in 1912, 2155 (of whom 1150 adult males, 504 adult females); in 1911, 2638 (of whom 1426 adult males, 604 adult females). The larger cities (communal population as calculated Dec. 31, 1913) follow: Amsterdam, 595,250; Rotterdam, 459,357; The Hague, 301,851; Utrecht, 124,415; Groningen, 79,082; Haarlem, 71,176; Arnhem, 65,018; Leiden, 59,500; Nimeguen, 59,147; Tilburg, 54,641; Dordrecht, 48,984; Maastricht, 39,429; Apeldoorn, 38,759; Leeuwarden, 38,366; Bois-le-Duc, 35,470; Enschede, 37,065; Delft, 34,909; Schiedam, 34,555; Zwolle, 33,836; Hilversum, 33,311; Emmen, 31,998; Deventer, 29,181; Breda, 27,981; Helder, 27,446.

EDUCATION. The Dutch system of education is peculiar in that the state encourages and subsidizes private instruction in preference to maintaining public schools, though these are provided by local taxation in the districts where other schools are inadequate. Primary instruction is compulsory between the ages of 7 and 13. The average attendance is 95 per cent. Secondary instruction is not free. A noteworthy feature is the excellence of the special agricultural and horticultural schools. There are universities at Amsterdam, Groningen, Leiden, and Utrecht (total students in 1913, 4120, of whom 1764 fe-

males), besides a technical university (1432 students in 1913, of whom 82 females).

PRODUCTION. The area (in hectares) devoted to principal crops, and the production (in metric quintals) for two years, with the production per hectare in 1913-14, are as follows:

	Hectares		Quintals		Qs. ha.
	1913-14	1914-15	1913-14	1914-15	
Wheat	58,567	64,815	1,464,175	1,545,837	25.0
Rye	226,678	222,157	8,717,437	8,486,976	16.4
Barley	27,201	25,565	698,879	704,060	25.8
Oats	139,945	141,855	2,896,861	2,851,285	20.7
Flax*	7,728	8,670	49,040	49,072	6.4
Beets*	63,234	57,090	19,941,820	16,661,446	815.4
Potatoes	128,885	171,758	25,257,750	23,883,608	150.0

* Fibre production.

† Sugar beets.

The quality of the wheat and oat crops in 1914-15 suffered from the too abundant August rains, which also caused the spread of *Phytophthora infestans* among potatoes on clay soils. There are grown for export great quantities of bulbs, shrubs, trees, vegetables, and fruits; bulbs, shrubs, and trees exported in 1911 were valued at 15,156,141 guilders; vegetables, 56,700,000; fruits, 2,546,000. There were in the country, June, 1913, 334,445 horses, 2,096,599 cattle, 842,018 sheep, 232,478 goats, 1,350,204 swine, 7,182,287 fowls, and 69,707 beehives.

From the state coal mines (mostly in Limburg), 1,725,394 metric tons were produced in 1912, valued at 12,044,500 guilders (1,292,289 metric tons in 1910, valued at 8,232,000 guilders). The North Sea fisheries products (hering) were valued at 10,763,841 guilders in 1912; oysters, 2,937,832 kilos. The fisheries products (North Sea) were valued at 11,654,951 guilders in 1910, exclusive of oysters (oyster catch, 3,210,614 kilos). There were reported in 1912 418 distilleries, 11 sugar refineries, 27 beet-sugar refineries, 33 salt works, 427 breweries, and 64 vinegar factories. Number of distilleries (1910), 464; breweries, 440; sugar refineries, 12; beet-sugar refineries, 27; salt works, 34; vinegar works, 73. Export of cheese (1910), 19,491,000 guilders.

COMMERCE. On account of the great war, the export of cereals and flour has been prohibited since Aug. 3, 1914; of cotton since Aug. 7; of rice since Sept. 3; and of linseed since Sept. 24. The decree of Jan. 26, 1915, suspending provisionally the prohibition on the export of raw cotton, has been annulled by a royal decree of June 2nd. The Netherlands is practically a free-trade country. The few duties levied have rather a fiscal than a protective object. The total imports for consumption and exports of domestic produce are seen below for three years (precious metals included), in guilders (par value of the guilder, 40.196 cents):

	1910	1912	1913
Imports	8,265,200,000	8,613,000,000	8,917,800,000
Exports	2,682,300,000	3,118,100,000	3,082,900,000

By great classes the trade is given in the table below for two years, in thousands of guilders:

	1912	1913	1912	1913
	Imports		Exports	
Foodstuffs	901,200	1,008,500	914,100	1,000,600
Raw matls.	1,391,300	1,503,400	1,038,400	1,022,400
Mfrs.	695,000	790,700	584,000	595,500
Misc.	579,900	604,100	558,800	446,100
Mdse.	3,567,400	3,901,700	3,094,800	3,064,600
O. & B.*	45,600	16,100	18,300	18,300
Total	8,613,000	8,917,800	8,118,100	8,182,900

* Coin and bullion.

The principal countries of origin and destination in the 1913 trade follow, with the value of their trade in thousands of guilders:

	Imps.	Exps.
Germany	1,188,800	1,477,700
Du. E. India	528,400	162,700
Russia	366,100	30,600
U. K.	339,600	656,800
U. S.	442,700	181,200
Belgium	352,000	339,600
Spain	99,400	11,900
Br. E. Ind.	99,900	8,800
Rumania	34,800	7,200
Brazil	42,100	900
Sweden	68,800	26,000
Norway	45,900	28,100
France	83,200	31,400
Turkey	10,900	20,700
Italy	12,100	22,200
Africa	13,000	20,000
Other	291,100	118,100
Total	3,917,800	3,082,900

Sailing vessels entered (1914), 869, of 667,643 cubic meters capacity (of which 549, of 159,577 cubic meters Dutch); cleared, 1014, of 688,196 cubic meters (635, of 182,657 cubic meters Dutch). Steamers entered, 11,585, of 37,650,703 cubic meters capacity (3771, of 12,788,122 cubic meters Dutch); cleared, 11,655, of 37,700,609 cubic meters (3845, of 12,983,966 cubic meters Dutch). Merchant marine, Jan. 1, 1915, 787 vessels, of 1,946,007 cubic meters capacity (407 steamers, of 2,036,664 cubic meters).

COMMUNICATIONS. On Jan. 1, 1912, there were in operation 3234 kilometers of railway; Jan. 1, 1913, 3256 kilometers; Jan. 1, 1915, 3339 kilometers. The land is a network of canals and rivers. State telegraph lines, 1913, 8098 kilometers; wires, 40,354 kilometers. Post offices, 1537; receipts, 18,593,000 guilders; expenditure, 15,484,000.

FINANCE. The 1916 budget is given below in detail:

Revenues	1000 gl.	Expenditure	1000 gl.
Excise	64,308	Internal adm.	19,790
Direct taxes	62,630	Interior (dept.)	44,230
Stamps, etc.	32,456	Public debt	42,701
Posts, etc.	3,003	War	85,002
Customs	17,681	Finance, etc.	64,040
Railways	4,425	Navy	27,140
Pilot dues	3,876	Agriculture, etc.	17,851
Domains	1,690	Justice	12,474
Lottery	655	Colonial office	8,080
Licenses	170	Foreign affairs	1,508
Mine duties	50	Civil list	815
Miscellaneous	33,815	Cabinet, etc.	838
		Miscellaneous	50
Total	224,708	Total	269,462

The receipts include 4,190,745 guilders extraordinary, and the expenditures 28,250,737 guilders extraordinary. The total public debt stood, Jan. 1, 1916, at 1,405,991,900 guilders; interest, 70,200,981.

NAVY. The Dutch East India possessions contribute to the maintenance of the fleet. A bill for the construction of a new East Indian fleet was defeated in May, 1912, the proposals being considered inadequate by the majority. Upon the defeat of the bill followed the resignation of Vice-Admiral Wentholt, minister of marine. An expenditure of 12,000,000 guilders (a reduction from the 40,000,000 first proposed) was voted in July following for coast-defense purposes, nearly half of which was intended for the fortifications at Flushing. Four destroyers built at

Flushing, two completed in 1911 and two in 1912, were for the East India service; their displacement is 515 tons, speed 30 knots, range 6200 miles. The four under construction in 1914 are also for the East India service. They displace 480 tons, and have a speed of 30 knots. Eight torpedo boats building, authorized in 1913, will displace 200 tons, and have a speed of 26 knots. Three gunboats building will displace 540 tons, and have a speed of 16 knots. Four submarines are building, 2 of which, of 350 tons submerged displacement, are for the East India service, and 2, of 200 tons submerged displacement, are for home waters. In their report of July, 1913, the commission of naval defense recommended the construction of 9 dreadnoughts, of 21,000 tons, 6 torpedo cruisers, of 1200, 8 destroyers, 44 torpedo boats, and 22 submarines.

The fleet is engaged in the protection both of Dutch waters and coasts, and of the East Indian possessions. It included, previous to the outbreak of the European war, 9 armored and 6 protected cruisers, of 66,430 aggregate tons; 4 mine-layers, of 1880 tons; 38 torpedo boats; 4 torpedo-boat destroyers; and 5 submarines.

GOVERNMENT. The executive power is vested in the sovereign; the legislative, in a parliament (States-General) of two chambers acting jointly with the sovereign. Reigning sovereign, Queen Wilhelmina, born Aug. 31, 1880; succeeded on the death of her father, Nov. 23, 1890, under the regency of her mother; became of age and was enthroned, Aug. 31, 1898; married, Feb. 7, 1901, Henry, Duke of Mecklenburg-Schwerin. Heir-apparent, Princess Juliana, born April 30, 1909.

HISTORY. Internal Affairs. On January 4th the Netherlands Overseas Trust Company was formed for the purpose of taking over from the government the responsibility for all shipments consigned to the Netherlands. The company also expected to place shipping on a firmer financial basis. Late in January, Great Britain and France agreed that all cargoes for the Netherlands, whether contraband or not, should be permitted to enter the country when consigned to the company. Early in January the government undertook to float a loan of 275,000,000 guilders (approximately \$100,000,000). Responses were so few at first that it was expected the government would be compelled to make it a forced loan, taxing all incomes which exceeded a certain amount. Later, however, the response became so great that the loan was oversubscribed nearly 100 per cent. In proportion to population the loan was nearly six times larger than any previous loan contracted in the Netherlands. Late in February the government increased the size of its extraordinary war debt from \$12,000,000 to \$20,000,000. Late in November a new taxation bill was introduced before Parliament, making the total taxation amount to \$105,000,000, or \$21 per capita. This was an increase of nearly \$5 per capita over the taxation of 1914.

The European War. At the end of December, 1914, there were 1,200,000 Belgian refugees in Holland. Besides this there was a mobilized Dutch army of 330,000 men. The country was put to its last resources to feed this tremendous number of dependents. Throughout the year Holland constantly was in trouble with the Allies or the Germans with regard to violation of her territory or capture and hindrance to her shipping. Late in January two Zeppelins flying

over Dutch territory aroused the first protest from the Netherlands government. In a note to Germany in the middle of February the Netherlands denied the general charges made against her that she was acting in an unneutral manner. At the same time the government protested against the action of the Germans in searching neutral vessels and against the policy of the British merchantmen in their continued use of neutral flags. The failure of Germany to answer the Dutch note caused much apprehension in the country and fear that a crisis was at hand. Reports that the country would declare war against Germany were denied, but the government continued to mass troops on the border opposite the Prussian forces. The capture on March 18th of the two Dutch vessels—*Batavier V* and *Zaanstroom*—by the German submarine *U-28* brought about another critical situation in the affairs of the two countries and demands from the press that Holland resent the action of her neighbor country. In April Great Britain allowed all conditional contraband and some articles on the absolute contraband list to pass through the war blockade zone providing they were consigned to the Netherlands government or the Netherlands Overseas Trust Company. On August 8th Holland enacted a new law calling to the colors practically every able-bodied man in the country. On August 23rd another German airship flew over Holland, this time eliciting an apology from the German government (August 28th) which claimed that adverse winds had blown the aviator from his course and over Dutch territory. Martial law over the movements of all workmen employed in making war munitions was declared on October 14th. All workmen who desired to travel from one district to another were required to obtain military permits. On November 11th the government announced that after the 25th inst. "a state of siege will be declared in some of the communes of North Holland, and also in some parts of Amsterdam, especially between Zaandam and the North Sea Canal, and in the communes of Mulden, Misauwar, Amstel, and Ouder Amstel."

NEUTRALITY. See UNITED STATES AND THE WAR.

NEVADA. POPULATION. The estimated population of the State on July 31, 1915, was 102,730. The population in 1910 was 81,875.

AGRICULTURE. The acreage, production, and value of the principal crops estimated by the United States Department of Agriculture in 1914-15 were as follows:

		Acreage	Prod. Bu.	Value
Corn	1915	1,000	85,000	\$38,000
	1914	1,000	88,000	40,000
Wheat	1915	56,000	1,660,000	1,577,000
	1914	45,000	1,382,000	1,266,000
Oats	1915	18,000	585,000	322,000
	1914	18,000	676,000	372,000
Barley	1915	12,000	576,000	408,000
	1914	13,000	611,000	397,000
Potatoes	1915	13,000	2,286,000	1,565,000
	1914	12,000	1,500,000	1,092,000
Hay	1915	225,000	675,000	5,062,000
	1914	247,000	803,000	6,665,000

a Tons.

LIVE STOCK. The United States Department of Agriculture estimated that on Jan. 1, 1916, and Jan. 1, 1915, horses numbered 77,000 and 78,000, valued at \$5,775,000 and \$5,382,000; mules numbered 3000 and 3000, valued at \$225,-

000 and \$237,000; milch cows numbered 25,000 and 24,000, valued at \$1,900,000 and \$1,860,000; other cattle numbered 472,000 and 450,000, valued at \$18,738,000 and \$18,315,000; sheep numbered 1,532,000 and 1,532,000, valued at \$8,886,000 and \$7,507,000; swine numbered 40,000 and 36,000, valued at \$360,000 and \$418,000. The production of wool in 1915 and 1914 was 5,890,000 and 5,502,000 pounds respectively.

MINERAL PRODUCTION. The gold production in the State in 1914 amounted to 555,402 fine ounces valued at \$11,481,188, compared with 570,580 fine ounces valued at \$11,795,130 in 1913. This continues the annual decline that has been notable since the record production of \$18,878,864 in 1910. There was a slight decrease in the production of silver in 1914, chiefly because of the lowered price of the metal in the last half of the year. The total output was 15,455,491 ounces valued at \$8,546,887, compared with 16,090,083 ounces valued at \$9,718,410 in 1913. In spite of the decrease Nevada held first place in the production of silver in 1914. The value of the total mineral production in 1914 was \$29,984,338, compared with \$37,842,084 in 1913.

TRANSPORTATION. The total mileage in the State in 1914 was 2416. The longest railways were those of the Central Pacific, 746; the San Pedro, Los Angeles, and Salt Lake, 267; and the Western Pacific, 427.

EDUCATION. The total school population in 1914 was 13,433 with a total enrollment in the public schools of 12,511. The average daily attendance in the schools was 9593. The teachers both male and female numbered 620. Provision was made by the Legislature of 1915 for teachers' pensions. The total expenditures for 1914 were \$625,562.

FINANCE. The receipts for the fiscal year ending 1914 amounted to \$881,538, and the disbursements to \$1,073,114. As the treasury began the year with a balance on hand of \$449,404, its favorable balance at the end of the year was reduced to \$257,828.

CHARITIES AND CORRECTIONS. The State institutions under the control of the State are the Nevada State Prison at Carson City, Nevada State Industrial School at Elko, Nevada Orphans' Home, Nevada Home for Mental Diseases at Reno. The Legislature of 1913 created a school of industry, which was not officially opened or ready for inmates until June, 1915. The Florence Crittenton School for Girls at Reno while not a State institution receives State aid.

POLITICS AND GOVERNMENT. The Legislature passed in February a so-called "easy divorce" bill, restoring the six months' residence requirement which had been abolished by the Legislature of 1913. Business men and women of all classes made demonstrations in favor of the measure. The bill became effective on its passage. Governor Boyle made an attempt to obtain a referendum on the law, but this was rejected by the Legislature, and as a result, there can be no change in the measure by a vote of the people, within two years.

STATE GOVERNMENT. Governor, Emmet D. Boyle; Lieutenant-Governor and Adjutant-General, Maurice J. Sullivan; Secretary of State, George Brodigan; Treasurer, Edward Malley; Auditor, Paul Gaston; Comptroller, George A. Cole; Superintendent of Public Instruction, John Edward Bray; Attorney-General, George B. Thatcher—all Democrats.

JUDICIARY. Supreme Court: Chief Justice, Frank H. Norcross, Republican; Justices, P. A. McCarran, Democrat; Ben W. Coleman, Democrat; Clerk, H. R. Mighels.

STATE LEGISLATURE:

	<i>Senate</i>	<i>House</i>	<i>Joint Ballot</i>
Republicans	10	24	34
Democrats	8	25	33
Independents	3	3	6
Socialists	1	1	2

NEVADA, UNIVERSITY OF. A State institution for higher education, founded in 1886 at Reno, Nev. The total enrollment in all departments in the autumn of 1915 was 387. The faculty includes 24 professors, 5 associate professors, 4 assistant professors, and 10 instructors. George Francis James, Ph.D., was appointed professor of education and director of the summer school. Louise Fargo Brown, Ph.D., was appointed dean of women; Charles Doggio was appointed instructor in Romance languages; and Charles Albert Norcross was appointed director of agricultural extension. James Reed Young was appointed assistant professor of sociology. The productive funds of the university, which is supported chiefly by legislative appropriations, amounted in 1915 to \$306,354, and the income to \$218,688. The library contained 39,000 volumes.

NEVARSENOBENZOL. See SALVARSAN AND NEOSALVARSAN.

NEW BRUNSWICK. One of the Maritime Provinces of the Dominion of Canada. The area is 27,985 square miles. The population at the 1911 census was 351,889. Fredericton, the capital, had, in 1911, 7208 inhabitants. New Brunswick is administered by a Lieutenant-Governor, who is appointed for five years by the Governor-General of the Dominion and who acts through a responsible executive council. The legislative House of Assembly consists of a single chamber of 46 members elected by popular vote for four years. Lieutenant-Governor in 1915, Josiah Wood, appointed March 6, 1912. Premier and minister of lands and mines, George J. Clarke. See CANADA.

NEW CALEDONIA. A French Melanesian colony. Area, with the Loyalty Islands, etc., 18,653 square kilometers, with about 50,600 inhabitants in 1911. Of this total the Wallis Archipelago occupies 96 square kilometers, and contains 4500 inhabitants; Fortuna and Alofi, 159 square kilometers, with 15,000. Nouméa, with 6968 inhabitants, is the capital. There are 16 kilometers of railway. Imports, 1913, 17,707,916 francs; exports, 15,838,405 francs. Vessels entered in the 1912 trade, 106, of 160,618 tons. The export of minerals in 1911 was valued at 7,351,000 francs. Debt, Jan. 1, 1912, 10,361,591 francs.

NEWFOUNDLAND. An island colony of Great Britain, on the northeast side of the Gulf of St. Lawrence. Area, 42,734 square miles; population (1911), 242,619; as estimated 1913, 247,574. St. Johns, the capital, had in 1911, 32,292 inhabitants; Harbour Grace, 4279; Bonavista, 3911; Carbonear, 3540; Twillingate, 3348. Fishing, agriculture, mining, and lumbering are the chief industries. The settlements are largely on or near the coast. Paper and pulp mills have been established at Grand Falls and Bishop's Falls.

Imports (1912-13), \$16,012,365; exports, \$14,672,889; shipping entered and cleared, 2,561,975 tons; revenue, \$3,919,040; expenditure, \$3,803,561. Public debt, Oct. 1, 1914, \$30,450,765. Reported length of government railway open to traffic, 794 miles; private railway, 47 miles; telegraph, 4897 miles.

Attached administratively to Newfoundland is that part of the peninsula of Labrador comprehended between Hudson Strait and Blanc Sablon, including the Hamilton basin. Labrador has a 600-mile coast-line and an area of about 120,000 square miles; population (estimated 1913), 3998.

An additional contingent of 250 soldiers and 75 naval reservists was sent to England March 30, 1915, making a total of 1000 soldiers and 1000 sailors furnished by the island.

NEW GUINEA. The largest of the East Indian islands. See DUTCH EAST INDIES; GERMAN NEW GUINEA; PAPUA.

NEW HAMPSHIRE. POPULATION. The estimated population of the State on July 31, 1915, was 440,584. The population in 1910 was 430,572.

AGRICULTURE. The acreage, production, and value of the principal crops estimated by the United States Department of Agriculture in 1914-15 were as follows:

		Acreage	Prod. Bu.	Value
Corn	1915	22,000	990,000	\$752,000
	1914	21,000	966,000	792,000
Oats	1915	12,000	456,000	246,000
	1914	12,000	456,000	264,000
Barley	1915	1,000	30,000	24,000
	1914	1,000	32,000	26,000
Potatoes	1915	16,000	1,520,000	1,444,000
	1914	17,000	2,708,000	1,622,000
Hay	1915	504,000	a 504,000	8,770,000
	1914	520,000	598,000	10,166,000
Tobacco	1915	100	b 140,000	17,000
	1914	100	177,000	32,000

a Tons. b Pounds.

LIVE STOCK. The United States Department of Agriculture estimated that on Jan. 1, 1916, and Jan. 1, 1915, horses numbered 47,000 and 47,000, valued at \$6,204,000 and \$5,969,000; milch cows numbered 97,000 and 95,000, valued at \$5,820,000 and 5,700,000; other cattle numbered 65,000 and 64,000, valued at \$1,852,000 and \$1,792,000; sheep numbered 37,000 and 38,000, valued at \$204,000 and \$186,000; swine numbered 55,000 and 52,000, valued at \$688,000 and \$728,000. The production of wool in 1915 and 1914 was 195,000 and 201,000 pounds respectively.

TRANSPORTATION. The total mileage of railways on June 30, 1914, was 12,052. There was no new construction in 1915.

EDUCATION. The total school population in 1914 was 73,480. The total enrollment was 63,004, and the average daily attendance was about 50,000. The average monthly salary of women teachers was \$42.80, and of men teachers, \$65.91.

FINANCE. The report of the State treasurer shows a balance on hand Sept. 1, 1914, of \$741,930. The total receipts were \$3,400,296. The disbursements for the same year were \$3,526,105, leaving a balance on hand on Sept. 1, 1915, of \$616,121. The total net indebtedness of the State was on the same date \$1,100,476.

CHARITIES AND CORRECTIONS. The charities and corrections under the control of the State

authorities include the county farms, the State Sanatorium for Tuberculosis Patients, the State Hospital for the Insane, New Hampshire Soldiers' Home, New Hampshire Orphans' Home, and the New Hampshire School for Feeble-minded. The penal institutions include the New Hampshire State prisons, the county jails, county house of corrections, and State industrial schools.

POLITICS AND GOVERNMENT. Governor Roland H. Spaulding was inaugurated on January 7th. His inaugural address was devoted almost entirely to suggestions for improving the business administration of affairs of the State. He opposed the authorization of any additional State roads at the present time, and declared that the present method of attempting to tax intangible property was a failure, and unjust in its workings.

STATE GOVERNMENT. Governor, Rolland H. Spaulding; Secretary of State, Edward C. Bean; Deputy Secretary of State, Hobart Pillsbury; State Treasurer, J. Wesley Plummer; Adjutant-General, Herbert E. Tutherly; Attorney-General, James P. Tuttle; Commissioner of Insurance, Robert Merrill; Labor Commissioner, John S. B. David; Commissioner of Agriculture, Andrew L. Felker.

JUDICIARY. Supreme Court: Chief Justice, Frank N. Parsons; Associate Justices, Reuben E. Walker, John E. Young, Robert J. Peaslee, William A. Plummer; Clerk, Arthur H. Chase.

STATE LEGISLATURE:

	Senate	House	Joint Ballot
Republicans	17	250	267
Democrats	6	150	156
Progressives	1	5	6
Republican majority..	10	95	105

NEW HEBRIDES. A group of Melanesian islands jointly administered by France and Great Britain through the French and English high commissioners for the Pacific. There are resident-commissioners: M. King, British; J. Miramende, French. Estimated area, 5100 square miles; estimated population, 70,000. There are Presbyterian and Roman Catholic missions. Vila, in the island of Efate, is the seat of government. A large proportion of the natives are cannibals, and the sale to them of arms, ammunition, and intoxicating liquors is prohibited. For 1914-15, the estimated revenue and expenditure were £21,218 and £10,400. Deficits are met by the British and French governments jointly. In addition, for 1914-15, there was an estimated British expenditure of £8156.

NEW JERSEY. POPULATION. According to the State census of 1915 the population of the State was 2,844,342 in that year. The population in 1910 was 2,537,167.

AGRICULTURE. The acreage, production, and value of the principal crops estimated by the United States Department of Agriculture in 1914-15 were as follows:

		Acreage	Prod. Bu.	Value
Corn	1915	285,000	10,830,000	\$8,122,000
	1914	272,000	10,472,000	7,952,000
Wheat	1915	78,000	1,560,000	1,654,000
	1914	79,000	1,422,000	1,550,000
Oats	1915	70,000	2,275,000	1,092,000
	1914	67,000	1,948,000	1,049,000
Rye	1915	71,000	1,420,000	1,806,000
	1914	70,000	1,295,000	1,062,000

	Acreage	Prod. Bu.	Value
Potatoes 1915	93,000	12,090,000	\$9,068,000
1914	92,000	9,936,000	6,061,000
Hay 1915	361,000	a 523,000	9,937,000
1914	361,000	487,000	9,496,000

a Tons.

LIVE STOCK. The United State Department of Agriculture estimated that on Jan. 1, 1916, and Jan. 1, 1915, horses numbered 92,000 and 92,000, valued at \$13,248,000 and \$13,432,000; mules numbered 4000 and 4000, valued at \$656,000 and \$676,000; milch cows numbered 152,000 and 146,000, valued at \$10,792,000 and \$9,928,000; other cattle numbered 73,000 and 70,000, valued at \$2,372,000 and \$2,205,000; sheep numbered 29,000 and 31,000, valued at \$186,000 and \$186,000; swine numbered 161,000 and 161,000, valued at \$2,061,000 and \$2,254,000. The production of wool in 1915 and 1914 was 95,000 and 97,000 pounds respectively.

MINERAL PRODUCTION. The production of iron ore in 1914 was 350,135 long tons, compared with a production of 325,305 tons in 1913. The marketed value of the product in 1914 was \$1,076,208, compared with a value of \$980,303 in 1913. The zinc mines of the State increased their output from 144,312,560 pounds of recoverable zinc in 1913 to 148,506,500 pounds in 1914. Owing to the low average price of spelter the value of the output decreased from \$8,081,502 in 1913 to \$7,515,914 in 1914. The quantity of ore sold or treated was 529,443 short tons in 1914, and 490,434 tons in 1913. The value of the total mineral production in 1914 was \$31,756,503, compared with \$35,931,191 in 1913.

TRANSPORTATION. The total railway mileage in the State on Jan. 1, 1915, was 5819. This includes 2417 of first track, 932 miles of second track, 166 miles of third track, 149 miles of fourth track, and 2353 miles of siding.

EDUCATION. The total school enrollment in the public schools for the fiscal year ending June, 1914, was 496,899. The average daily attendance was 382,218. The teachers, male and female, numbered 15,085. The total expenditures for the year were \$25,783,914.

FINANCE. The total receipts for the fiscal year ending Oct. 31, 1914, were \$9,036,340, and the disbursements, \$9,678,727. The balance on hand at the end of the year was \$1,085,605, which includes a balance at the beginning of the year of \$1,727,992.

CHARITIES AND CORRECTIONS. The charitable and correctional institutions under the control of the State include State Hospitals for the Insane at Morris Plains and Trenton, State Home for the Feeble-minded at Vineland, New Jersey State Home for Epileptics, New Jersey State Prison, New Jersey Reformatory, State Home for Boys, State Home for Girls, Soldiers' Home at Kearny, Soldiers' Home at Vineland, and the Sanatorium for Tuberculosis Diseases.

POLITICS AND GOVERNMENT. The Legislature passed a bill which was signed by Governor Fielder allowing the appointment of women as police officers in the State. A local option bill passed the Senate on March 2nd, by a vote of 11 to 2. It was, however, defeated in the House of Representatives on March 23rd, by a vote of 44 to 13, in one of the most stormy sessions of recent years. The Legislature passed a joint resolution amending the State Constitution by extending suffrage to women. As the amendment had passed two successive Legislatures it was

submitted to a popular vote at a special election on October 19th. The amendment was defeated by a vote of 133,201 for, and 184,474 against. See WOMAN SUFFRAGE.

Governor Fielder on April 13th vetoed bills designed to amend, and, in his opinion, to weaken three of the so-called "seven sisters" anti-trust laws, which were prepared under the supervision of President Wilson, when he was Governor of New Jersey, and were passed by the Legislature of 1913. A bill proposed to abolish capital punishment was defeated in the House of Representatives on April 7th by a vote of 28 to 21.

As the suffrage question, the most important issue in State politics in 1915, had been decided on October 19th, there was a lack of general interest in the election of November 2nd. The voting was confined to the election of six members of the State Senate, and full membership of 60 in the House. In these elections the Republicans retained a majority in the State Legislature.

STATE GOVERNMENT. Governor, James F. Fielder, Democrat; Secretary of State, Thomas F. Martin, Democrat; Treasurer, Edward E. Grosscup, Democrat; Comptroller, Edward I. Edwards, Democrat; Attorney-General, John W. Wescott, Democrat; Adjutant-General, Wilbur F. Sadler, Jr., Republican; Commissioner of Education, Calvin N. Kendall, Democrat; Commissioner of Insurance, G. M. La Monte, Democrat.

JUDICIARY. Supreme Court: Chief Justice, William S. Gummere; Associate Justices, C. G. Garrison, F. J. Swayze, T. W. Trenchard, Charles W. Parker, James J. Bergen, J. r. Minturn, Samuel Kalisch, Charles C. Black; Clerk, William C. Gebhardt.

STATE LEGISLATURE:

	Senate	House	Joint Ballot
Republicans	13	41	54
Democrats	8	19	27
Republican majority..	5	22	27

NEW JERSEY CANAL. See CANALS.

NEW MEXICO. POPULATION. The estimated population of the State on July 31, 1915, was 396,917. The population in 1910 was 327,301.

AGRICULTURE. The acreage, production, and value of the principal crops estimated by the United States Department of Agriculture in 1914-15 were as follows:

	Acreage	Prod. Bu.	Value
Corn 1915	105,000	2,730,000	\$1,993,000
1914	92,000	2,576,000	2,061,000
Wheat 1915	97,000	2,156,000	1,941,000
1914	76,000	1,838,000	1,654,000
Oats 1915	60,000	2,160,000	1,080,000
1914	52,000	1,976,000	889,000
Barley 1915	8,000	264,000	185,000
1914	5,000	170,000	128,000
Potatoes 1915	8,000	800,000	760,000
1914	9,000	900,000	855,000
Hay 1915	201,000	a 442,000	3,890,000
1914	206,000	515,000	4,790,000

a Tons.

LIVE STOCK. The United States Department of Agriculture estimated that on Jan. 1, 1916, and Jan. 1, 1915, horses numbered 234,000 and 217,000, valued at \$13,572,000 and \$11,935,000; mules numbered 17,000 and 16,000, valued at \$1,445,000 and \$1,296,000; milch cows numbered 76,000 and 82,000, valued at \$5,092,000 and \$4,182,000; other cattle numbered 1,090,000 and 991,000, valued at \$43,709,000 and \$35,180,000;

1914 amounted to 6344 fine ounces, against 6117 ounces in 1913. The value of the gold output in 1914 was \$131,141, and in 1913, \$126,448. The value of the clay products in 1914 was \$1,460,790 and, in 1913, \$1,614,406. The stone produced was valued at \$1,407,671, compared with \$1,212,501 in 1913. The total value of the State's mineral production in 1914 was \$3,519,245, compared with \$3,739,696 in 1913.

TRANSPORTATION. The railway mileage of the State on Jan. 1, 1913, was 4799.

EDUCATION. The school population of the State for 1914-15 was 778,283, of whom 525,107 were white and 253,276 colored. The enrollment of white children was 409,728, and of colored, 189,918. The average daily attendance of white children was 288,134, and of colored children, 119,630. There were 13,255 teachers, of whom 10,082 were white. The total expenditures for school purposes were \$5,566,992. The Legislature of 1915 amended the school laws in important details. It passed a State-wide bond act for school buildings, and increased the powers and duties of the State Superintendent.

FINANCE. The report of the State Treasurer for the fiscal year ending Nov. 30, 1914, shows the receipts for the period of \$5,150,107. The disbursements for the same period were \$4,980,305, leaving a balance at the end of the year of \$169,802, which includes a balance at the beginning of the year of \$337,678.

CHARITIES AND CORRECTIONS. The institutions under the control of the State include Hospitals at Morgantown, Raleigh, and Goldsboro, Epileptic Colony, School for the Blind, School for the Colored Blind and Deaf, Soldiers' Home, the State Prison, School for the White Deaf at Morgantown, Jackson Manual Training and Industrial School at Concord, Orphanage for White Children, and Orphanage for Colored Children at Oxford.

POLITICS AND GOVERNMENT. The House on February 4th killed a proposed woman's suffrage amendment by a vote of 67 to 38. Bills designed to bring about an enforcement of the law against child labor also failed to pass. A measure for the sale of liquor, known as the Anti-Jug Act passed the Legislature. This act forbids the shipment to and receipt by any person of more than one quart of spirituous liquor, and five gallons of malt beverage every 15 days.

STATE GOVERNMENT. Governor, Locke Craig; Lieutenant-Governor, E. L. Daughtridge; Secretary of State, J. B. Grimes; Treasurer, B. R. Lacy; Auditor, W. P. Wood; Adjutant-General, Lawrence W. Young; Attorney-General, T. W. Bickett; Superintendent of Education, J. Y. Joyner; Commissioner of Agriculture, W. A. Graham; Commissioner of Insurance, J. R. Young—all Democrats.

JUDICIARY. Supreme Court: Chief Justice, Walter Clark; Justices, George H. Brown, William A. Hoke, William R. Allen, P. D. Walker; Clerk, J. L. Seawell.

STATE LEGISLATURE, 1915:

	<i>Senate</i>	<i>House</i>	<i>Joint Ballot</i>
Democrats	47	104	151
Republicans	1	6	7
Progressives	2	10	12
Democratic majority .	44	88	132

NORTH CAROLINA, UNIVERSITY OF. A State institution for higher education, founded

at Chapel Hill, N. C., in 1893. The total enrollment in all departments in the autumn of 1915 was 1127. The faculty numbered 85. There were no notable changes in the membership of the faculty during the year. The benefactions include \$5000 for the Mill Lecture Fund, \$1000 for a Mill Scholarship, and \$25,000 for the Emerson Athletic Field. The productive funds during the fiscal year 1915 amounted to \$185,900, and the annual income to \$14,644. The library contained about 75,000 volumes.

NORTH DAKOTA. POPULATION. The estimated population of the State on July 31, 1915, was 2,311,095. The population in 1910 was 577,056.

AGRICULTURE. The acreage, production, and value of the principal crops estimated by the United States Department of Agriculture in 1914-15 were as follows:

	<i>Acreage</i>	<i>Prod. Bu.</i>	<i>Value</i>
Corn ....1915	700,000	9,800,000	6,566,000
1914	500,000	14,000,000	8,120,000
Wheat ..1915	8,350,000	151,970,000	182,214,000
1914	7,285,000	81,592,000	82,408,000
Oats ....1915	2,450,000	98,000,000	26,460,000
1914	2,318,000	64,904,000	24,014,000
Rye ....1915	180,000	2,700,000	2,188,000
1914	131,000	2,240,000	1,882,000
Barley ..1915	1,400,000	44,800,000	19,712,000
1914	1,450,000	28,275,000	12,724,000
Potatoes .1915	80,000	7,200,000	2,952,000
1914	70,000	7,680,000	3,205,000
Hay ....1915	440,000	660,000	3,762,000
1914	400,000	580,000	3,016,000

a Tons.

LIVE STOCK. The United States Department of Agriculture estimated that on Jan. 1, 1916, and Jan. 1, 1915, horses numbered 801,000 and 785,000, valued at \$88,110,000 and \$86,350,000; mules numbered 9000 and 8000, valued at \$1,116,000 and \$976,000; milch cows numbered 373,000 and 339,000, valued at \$21,261,000 and \$20,848,000; other cattle numbered 577,000 and 515,000, valued at \$20,195,000 and \$18,540,000; sheep numbered 250,000 and 250,000, valued at \$1,275,000 and \$1,125,000; swine numbered 706,000 and 642,000, valued at \$6,354,000 and \$7,576,000. The production of wool in 1915 and 1914 was 1,677,000 and 1,620,000 pounds respectively.

MINERAL PRODUCTION. The output of coal in the State increased from 495,320 tons, valued at \$756,652 in 1913 to 506,685 tons, valued at \$771,379 in 1914. The total output was lignite coal, which was the only mineral fuel of the State. At the present time lignite is consumed chiefly for domestic purposes, but when properly handled it can be used satisfactorily as a boiler fuel. There were employed in the coal mines in the State, in 1914, 558 men. The mines were entirely free from strikes, suspensions, or lock-outs. The total value of all mineral products for 1914 was \$1,063,540, compared with \$1,055,676 in 1913.

EDUCATION. The total school population in the State in 1915 was 186,604. In 1914 there were enrolled 148,021 with an average daily attendance of 102,490. Male teachers numbered 1300, women teachers, 6611. The total expenditures for the year amounted to \$6,611,648.

FINANCE. The total receipts from all sources for the fiscal year 1915 amounted to \$4,704,229. The disbursements for the same period amounted to \$5,436,016, leaving a balance at the end of the fiscal year of \$901,629, which includes a balance

at the beginning of the year of \$1,633,417. All State departments in 1915 were working under the budget system.

CHARITIES AND CORRECTIONS. The charities and corrections are under the control of the State and include Hospital for the Insane at Jamestown, Institute for Feeble-minded at Grafton, Reform School at Mandon, School for the Blind at Bathgate, Tuberculosis Sanatorium at Dunseith, State Penitentiary at Bismarck, and School for the Deaf at Devils Lake. The Soldiers' Home at Lisbon is not under the State Board.

POLITICS AND GOVERNMENT. The Legislature on March 5th passed a measure abolishing capital punishment, and it was signed by the Governor. The Senate on February 19th recalled from the House an equal suffrage bill which had been previously passed in the Senate. The bill passed both houses in 1913. No further action was taken on the bill during the session.

STATE GOVERNMENT. Governor, L. B. Hanna; Lieutenant-Governor, J. H. Fraine; Secretary of State, Thomas Hall; Treasurer, John Steen; Auditor, Carl O. Jorgenson; Adjutant-General, Thomas Tharaldson; Attorney-General, H. J. Linde; Superintendent of Education, E. J. Taylor; Commissioner of Agriculture, Robert F. Flint; Commissioner of Insurance, W. C. Taylor—All Republicans.

JUDICIARY. Supreme Court: Chief Justice, B. F. Spalding; Justices, Charles J. Fisk, E. T. Burke, E. B. Goss, A. A. Bruce; Clerk, R. D. Hoskins.

STATE LEGISLATURE:

	<i>Senate</i>	<i>House</i>	<i>Joint Ballot</i>
Republicans	44	106	150
Democrats	5	6	11
Republican majority ..	39	100	139

NORTH DAKOTA, UNIVERSITY OF. A State institution for higher learning founded at Grand Forks in 1883. The total enrollment in all departments in the autumn of 1915 was 831. The faculty numbered 93. There were no notable changes in the membership of the faculty during the year, and no noteworthy benefactions were received. The productive funds amounted at the end of the fiscal year to \$1,700,000, and the income to about \$300,000. The institution is supported chiefly by legislative appropriations. The library contains about 53,000 volumes. The president was Frank L. MacVey, Ph.D., LL.D.

NORTHERN NIGERIA. See NIGERIA, COLONY AND PROTECTORATE OF.

NORTHERN TERRITORY. See AUSTRALIA.

NORTHWESTERN UNIVERSITY. An institution for higher education founded in 1851 at Evanston, Ill. Certain of the departments are in Chicago. The total enrollment in all departments on Nov. 1, 1915, was 4938. The faculty numbered 485. During the year the university lost by death George Green V. Black, dean of the dental school. No noteworthy benefactions were received during the year. The productive funds amounted to about \$5,000,000. The annual income amounted to \$1,400,000. The library contains approximately 200,000 volumes. The president is A. W. Harris, LL.D.

NORTHWEST PROVINCES. The Canadian provinces of Manitoba, Alberta, and Saskatche-

wan. See the articles under these titles; see also CANADA.

NORTHWEST TERRITORIES. See CANADA, *Area and Population*.

NORWAY. A constitutional monarchy of northern Europe, occupying the western portion of the Scandinavian Peninsula. Christiania is the capital.

AREA AND POPULATION. The area and population (*de facto*), according to the census of Dec. 31, 1910, are given below by amter (prefectures)—first the land area, second the total area, including fresh waters; in the third column is given the total population, and in the last the density per square kilometer:

<i>Amter</i>	<i>Sq. km.</i>	<i>Sq. km.</i>	<i>Pop.</i>	<i>D.</i>
Smaalene ..	3,869.51	4,144.14	150,690	38.9
Akershus ..	4,908.11	5,285.80	129,323	26.4
Christiania ..	16.32	16.55	242,850	....
Hedemarken ..	26,238.19	27,480.47	183,685	5.1
Christians ..	24,130.62	25,275.86	118,901	4.9
Buskerud ..	14,015.78	14,816.87	128,868	8.8
Jarlsberg &				
Larvik	2,244.68	2,819.58	108,888	46.0
Bratsberg ..	14,149.28	15,189.09	106,791	7.6
Nedene	8,772.22	9,348.00	71,722	8.1
Lister &				
Mandal ...	6,881.17	7,264.24	77,287	11.2
Stavanger ...	8,671.64	9,147.15	187,581	15.9
Søndre Bergen-				
hus	15,104.51	15,606.40	141,618	9.4
Bergen	18.08	18.55	75,888	...
Nordre-Bergen-				
hus	17,826.41	18,481.51	88,984	5.0
Romsdal	14,591.06	14,990.14	148,109	9.8
Søndre Trondh-				
jem	17,814.65	18,612.37	147,348	8.8
Nordre Trondh-				
jem	21,100.48	22,495.14	84,640	4.0
Nordland	87,178.34	88,646.07	161,105	4.3
Troms	25,710.40	26,246.05	80,554	3.1
Finmarken ..	46,406.92	47,580.84	89,126	0.8
Total	809,683.22*	822,908.82†	2,357,790	7.6

* 119,549 sq. miles. † 124,675 sq. miles.

Of the above total population, 1,123,160 were males, and 1,234,630 were females. The rural population numbered 1,657,695, and the urban, 700,095. The total resident, or legal, population (*de jure*) numbered 2,391,782 (1,155,673 males, 1,236,109 females); in 1900, 2,240,032; in 1890, 2,000,917. Estimated legal population at the end of 1912, 2,439,209.

In the following list of cities the *de facto* population, according to the 1910 census, is given with the *de jure* population in parentheses: Christiania, 242,850 (241,834); Bergen, 75,888 (76,867); Trondhjem, 46,256 (45,335); Stavanger, 36,621 (37,261); Drammen, 24,937 (24,895); Fredrikstad, 15,481 (15,597); Christiansand, 15,408 (15,291); Christiansund, 15,891 (13,201); Aalesund, 14,785 (13,858); Skien, 12,099 (11,856); Fredrikshald, 12,023 (11,992); Sarpsborg, 10,018 (9846).

Marriages in 1910 and 1912 numbered 14,566 and 14,797 respectively; births, 61,461 and 61,151; deaths, 31,856 and 32,219; emigrants, 18,912 and 9105.

The majority of the people are Lutherans (2,329,229 in 1910 belonging to the state church and 15,287 to the Free Lutheran Church); Methodists and Baptists are next in numbers (10,986 and 7659 respectively). All creeds are tolerated. Jesuits are debarred.

PRODUCTION. Only about one thirtieth of the total area is cultivable; about one-third is under forest; the remainder is uncultivated pasture, barren table-lands, and uninhabitable mountains.

The crops raised are not sufficient for home consumption, and the importation of cereals and meats is large. Below are seen areas devoted to main crops and yield for two years, with yield per hectare in 1913-14 (the figures for 1914-15 are provisional):

	Hectares		Quintals		Qs.
	1913-14	1914-15	1913-14	1914-15	
Wheat . . .	5,024	5,024	73,189	73,189	14.6
Rye	15,163	15,163	265,420	265,420	17.5
Barley . . .	86,182	86,182	564,178	564,178	15.6
Oats	109,105	109,105	1,853,549	1,853,549	12.4
Potatoes . .	42,021	.....	6,989,611	.....	166.8

Live stock (1910) on farms: 167,714 horses, 1,133,613 cattle, 1,398,383 sheep, 287,686 goats, and 333,709 swine. Reindeer (1907), 142,623; fowls, 1,391,347; ducks, 8230; geese, 9670; turkeys, 2961; beehives, 20,223. There were (1910) 742 cheese and condensed milk factories and creameries, employing 1021 men and 1710 women; production of butter, 3,707,231 kilos, and of cheese, 7,796,739 kilos. Mineral production is increasing. The mines employed 6246 persons in 1910, and 5987 in 1911; value of output from the mines, 1911, 12,829,000 kroner. At the end of 1911 there were 6077 industrial establishments, employing 136,025 work people and 779,840 horsepower. Export of forest produce (1910), 80,339,000 kroner (wood pulp, 39,473,000).

The fisheries products are important, the total catch in 1910 being valued at 89,753,000 kroner. Employed in the cod fisheries in 1912 were 21,211 boats and 94,281 fishermen. Production of cod, 99,303,000; of livers, 224,267 hectoliters; of roe, 55,198 hectoliters. Total value of output of the cod fisheries, 26,718,000 kroner. Total output of the herring fisheries, 2,720,000 hectoliters, valued at 12,502,000 kroner.

COMMERCE AND COMMUNICATIONS. By royal decree of Aug. 21, 1914, the export of cereals and flour has been prohibited. Raw cotton may not be exported since May 23, 1915. In the table below are seen imports and exports for three years, values in kroner (the par value of the krone is 26.799 cents):

	1910	1912	1913
Imports	429,228,800	560,804,100	590,894,000
Exports	309,780,400	370,741,500	431,078,000

Imports and exports, in millions of kroner:

	Impe.	Expe.
Cereals	65.1	1.8
Col. prods	89.1	0.7
Animals	29.4	136.1
Fruits, etc.	11.4	0.8
Spirits	9.7	0.2
Minerals	52.5	54.3
Coal, etc.	47.1	1.8
Metals	33.5	18.3
Hides, etc.	24.1	33.8
Yarns, etc.	14.6	1.0
Wood	13.5	34.1
Textiles	59.1	1.7
Metal mfrs.	38.3	2.3
Wood mfrs.	13.5	59.9
Leather mfrs.	2.7	0.2
Paper, etc.	4.9	33.6
Oils	40.9	17.3
Drugs, etc.	3.7	0.6
Various	97.8	32.6
Total 1913	590.9	431.1
Total 1911	495.7	325.4
Total 1909	386.6	264.3
Total 1905	312.3	218.0
Total 1900	310.7	172.9

Countries of origin and destination follow, with the value of the 1913 trade given in millions of kroner:

	Impe.	Expe.
Germany	176.3	89.8
U. K.	146.2	104.8
Sweden	84.8	26.7
Russia	25.6	15.4
U. S.	89.2	84.8
Denmark	28.3	9.2
Netherlands	21.0	20.1
Belgium	17.9	14.8
France	11.7	15.1
Spain	4.5	12.5
Italy	3.8	11.1
Portugal	1.7	10.0
Other	29.9	66.6
Total	590.9	431.1

Total vessels entered at Norwegian ports in 1912, 11,059, of 5,426,162 tons; cleared, 10,971, of 5,379,888; 1913, entered, 10,953, of 5,766,035; cleared, 10,994, of 5,772,603. Vessels entered in the 1910 trade, 12,083, of 4,966,859 tons; cleared, 11,773, of 4,974,157. The merchant marine included, Jan. 1, 1913, 1106 sail, of 632,989 tons; steam and motor, 2126, of 1,085,617 tons—a total of 3232 vessels, of 1,718,606 tons; Jan. 1, 1914, 3290 vessels, of 1,767,405 tons. The merchant marine included Jan. 1, 1911, 3047 vessels, of 1,526,156 tons (steamers, 1842, of 895,869).

Length of railway in operation in 1911, 3085 kilometers; of state telegraph lines, 11,013; of wires, 21,127. Total length of railways open to traffic in 1913, 3097 kilometers; 1914, 3165 kilometers. State telegraph lines in 1914, 11,648 kilometers, with 23,039 kilometers of wire, and 1873 stations. Telegraph receipts for 1913-14, 7,886,804 kroner; expenditure, 6,514,965 kroner. Post offices numbered 3640. Postal receipts for 1913-14, 10,709,137; expenditure, 10,474,161 kroner.

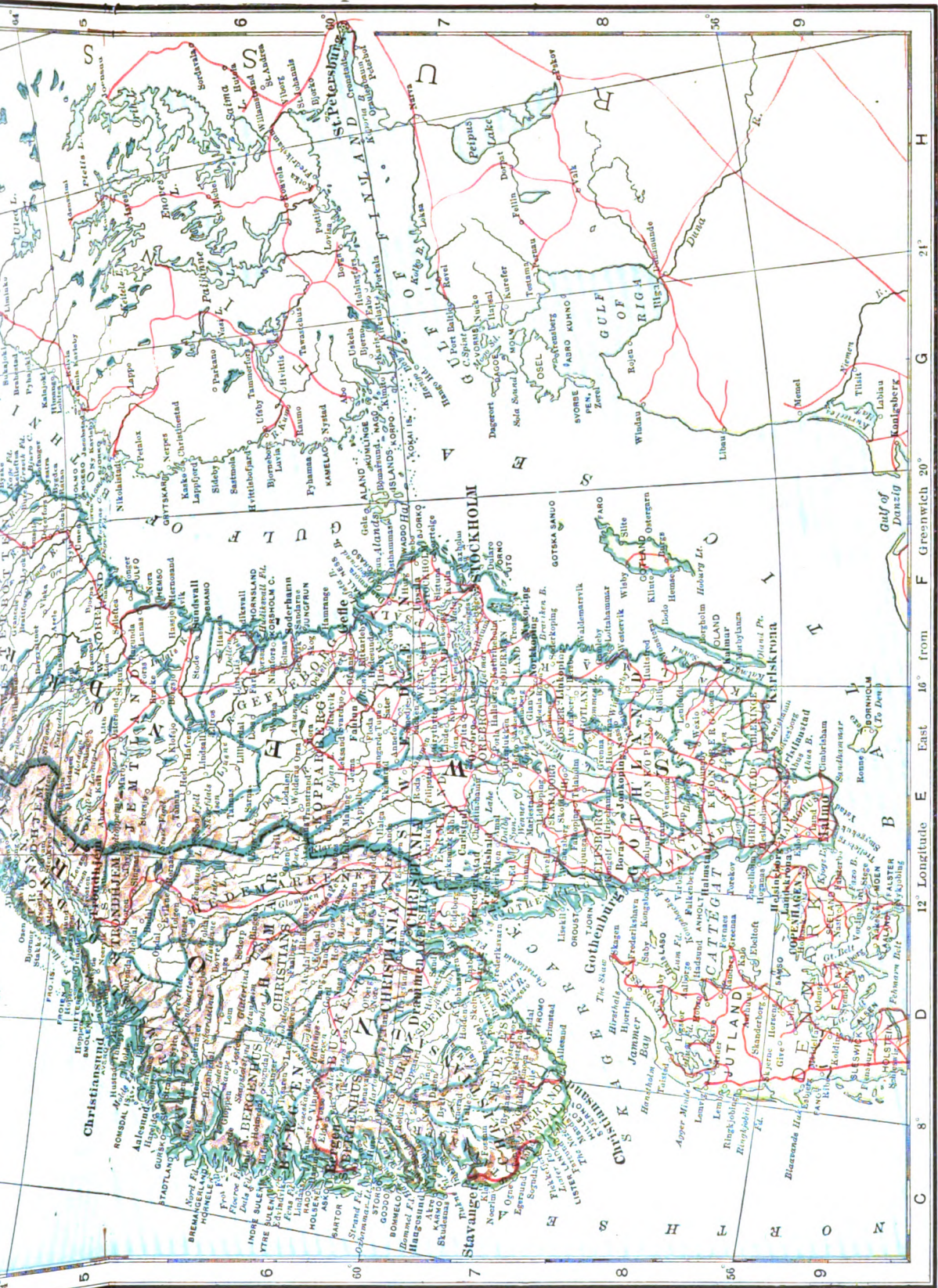
During 1915 the state railway construction in Norway was progressing rapidly, although some of the most important works were somewhat behind the schedule time originally intended. The Doore and Rauma railways were to have been completed in 1917, but both were behind time. Likewise the estimated cost had been greatly exceeded, as according to the railway plan of 1908, lines expected to cost \$13,600,000 were involving actual expenditures of \$23,200,000. Furthermore, alterations and further new lines which had been decided upon later and which had been calculated to entail an aggregate expenditure of \$9,400,000, would cost \$2,700,000 more than had been originally estimated.

FINANCE. The unit of value is the krone (par value 26.799 cents). In the table below is given in detail the budget for 1913-14:

Revenue	1000 kr.
Finance*	101,048
Public works	49,769
Instruction, etc.	4,508
Justice	2,027
Agriculture	1,508
From loans	9,041
Defense	397
Commerce, etc.	540
Foreign affairs	56
Various	102
Total	175,962

* Customs, 55,784,238 kroner; direct taxes, 17,090,068.





12° Longitude E East 16° from Greenwich 20° 21° H G F E D C

Expenditure	1000 kr.
Public works	48,928
Defense	21,287
Finance	21,049
Instruction	15,108
Justice, etc.	8,428
Agriculture	8,846
Commerce, etc.	2,220
Council of state	1,868
Foreign affairs	1,145
Civil list	747
Storthing	709
Miscellaneous	240
Total	120,108
Extraordinary	798

The total capital of the national debt stood, March 31, 1911, at 355,452,820 kroner; June 30, 1913, at 362,743,499 kroner (148.30 per capita). Of the latter total, 21,952,795 represented the internal, and 340,790,704 the external debt. On June 30, 1914, the national debt was 357,394,462 kroner.

NAVY. The active fleet included (1913) the following: Four coast-defense vessels (16,300 tons), 2 monitors (3500), 3 first-class gunboats (3250), 8 second-class gunboats (2270), 2 torpedo-boat destroyers (1100), 1 torpedo dispatch boat (410), 10 first-class torpedo boats (1020), 27 second-class torpedo boats (1840), 1 third-class (30), 1 submarine (200)—all built. Building: Two coast defense vessels, 1 torpedo-boat destroyer, 4 submarines. Personnel of the navy, about 3400.

GOVERNMENT. The King is the executive, acting through a Council of State, whose members are responsible heads of departments. The legislative body is the representative Storthing, made up of the Lagthing and the Odelsting. The reigning sovereign in 1915 was Haakon VII, son of the late King Frederick VIII of Denmark. The heir-apparent was Prince Olaf, born July 2, 1903.

HISTORY

INTERNAL AFFAIRS. In August and September a grave situation arose because of a scarcity of food and the unprecedented high prices of the few commodities which were to be obtained. Norway considered seriously following the lead of Denmark in commandeering all breadstuff materials and forbidding the exportation of food products. The advance in prices of foods was similar to the advance which took place in Sweden, but was higher in many instances. Meat prices were the highest ever known. On October 11th women voted for the first time in Norwegian elections. A bill in 1907 gave women who paid taxes the right to vote, but it was not until 1913 that the Storthing passed a law permitting all women to vote, regardless of the question of taxes.

EFFECTS OF THE EUROPEAN WAR. Late in February the torpedoing of the Norwegian steamer *Regin* brought stormy protestations from the newspapers and a demand that German goods be boycotted. The government demanded to know Germany's reason for the destruction of the boat. The War Insurance Bureau directed in February that all ships be marked with the word "Norge" on the sides and carry the Norwegian colors. The action of Germany in destroying the tank steamer *Belridge* caused Norway to protest to the German government and to demand damages amounting to \$67,000. In June Germany replied that an investigation had

shown that the *Belridge* was torpedoed on February 19th by a German submarine which mistook it for an enemy ship. Germany deplored the loss and offered to pay full damages, such as might be decided upon by a commission of German and Norwegian experts. Germany disclaimed responsibility, however, for the destruction of the steamer *America* in the North Sea on May 5th. On June 23rd M. Ihlen, the Norwegian foreign minister, expressed the hope that Germany would take steps to safeguard neutral shipping in the future. M. Ihlen said in part: "Whatever differences of opinion may exist regarding rights under international law, it is my hope that the German government, having learned through experience how easily mistakes are made, will give commanders of German warships such instructions as will make neutral shipping safe." This speech was delivered at the opening of the Norwegian Storthing. Late in July Sir Edward Grey, British secretary for foreign affairs, expressed regret to Norway that her neutrality had been violated by the Allies, especially in the case of the British warship which had made captive a German warship within the three-mile limit established by international law. This action on the part of Sir Edward Grey pleased the Norwegians and was acclaimed by the press, which also appealed to the government to demand satisfaction from Germany for the torpedoing of several Norwegian ships. On September 9th the German government offered indemnity for the sinking on July 9th of the steamer *Svein Jarl*. On October 6th this offer was accepted by the Norwegian government.

For a detailed list of the Norwegian merchantmen destroyed or captured, see WAR OF THE NATIONS, *Naval Losses*.

ELECTIONS. In elections to the Lower House of the Storthing, the Liberal Party (the Left) was returned triumphantly with 77 members; the Right was returned with only 22; the Social Democrats, with 19; besides four independents.

NORWEGIAN LITERATURE. See SCANDINAVIAN LITERATURE, under the section *Norwegian*.

NOVA SCOTIA. One of the Maritime Provinces of the Dominion of Canada. The area is 21,428 square miles; the population, at the 1911 census, 492,338. Capital, Halifax, with (1911) 46,619 inhabitants. The province is administered by a Lieutenant-Governor, who is appointed for five years by the Governor-General of Canada, and who acts through a responsible executive council. The legislative power is vested in a Legislative Council of 21 appointed members, and a House of Assembly of 38 elected members. Lieutenant-Governor in 1915, James Drummond McGregor, appointed Oct. 18, 1910. Premier and provincial secretary in 1915, G. H. Murray. See CANADA.

NOYES, ALFRED. See LITERATURE, ENGLISH AND AMERICAN, *Poetry*.

NUTRITION. See FOOD AND NUTRITION.

NYASSALAND PROTECTORATE. A British protectorate extending from German East Africa to Portuguese East Africa, between Rhodesia and Lake Nyassa, and having an area stated at 39,801 square miles. Population (March 31, 1910), 970,430; 766 Europeans, 481 Asiatics (exclusive of Sikh troops), 969,183 natives. Population estimated, March 31, 1913,

the chief town is Blantyre, in the Shire Highlands. The cultivation of coffee has declined, that of cotton increased, 8093 bales of 400 pounds being exported in 1912-13, 6000 bales in 1913-14. Tobacco exported in 1913-14, 3,763,014 pounds. Total imports, 1913-14, £189,210 (£199,710 in 1910-11); exports, £200,734 (£168,911). Local revenue (1913-14), £124,849; expenditure, £133,106. There is a railway (113 miles) from Blantyre to Port Herald; its extension to the Zambezi has been undertaken. Steamships ply on Lake Nyassa and on the rivers of the protectorate.

OATS. The climatic conditions prevailing during the growing season of 1915 were in most countries generally favorable to the growth of the oats crop and the production of a good yield. According to an estimate by the International Institute of Agriculture the production of oats in the Northern Hemisphere, where nearly 98 per cent of the world's crop is produced, was about 4,859,000,000 bushels, or superior to all other years. This estimate was based on official data to the extent of 69 per cent, while for countries not furnishing official figures the yield for 1915 was assumed as being the same as the average yield for the last four or five years. Taking into account the large total production and considering the average consumption during the past five years as a basis it was concluded that the 1915 production in the Northern Hemisphere was sufficient to meet the needs of consumption in the same hemisphere during 1915-16.

Nearly one-half the 1915 crop of the Northern Hemisphere was produced in North America. The Canadian crop was estimated at 481,035,500 bushels from 11,365,600 acres, a high average yield per acre of 42.33 bushels. The United States, as reported by the Department of Agriculture, produced 1,540,362,000 bushels on 40,780,000 acres, the average acre yield being 37.8 bushels. Based on the farm value of 36.1 cents per bushel on Dec. 1, 1915, the value of the crop was \$555,569,000. Neither the production, the acreage, nor the total crop value had ever before been reached. As pointed out in the report of the Secretary of Agriculture, the exports of oats in 1915 as compared with the preceding year increased from \$1,000,000 to \$57,000,000, or from 2,000,000 to 97,000,000 bushels, about 8 per cent of the crop. This increase in exports apparently had some influence on prices, as the average price per bushel to farmers was 30 cents, compared with 29 cents the preceding year. The average annual value of oats carried in international trade is estimated at about \$102,000,000, but the War of the Nations in Europe continued to interfere with commerce and trade, and thus influenced the movement of oats and of other cereals to a very great extent. In all belligerent, as well as many neutral, countries, the exportation of oats was prohibited in order to protect their food and feed supplies.

An inquiry regarding the production and use of oat straw in the United States, made by the Department of Agriculture, indicated an average annual production of 41,824,000 tons, of which 30,024,000 tons, or 71.8 per cent, are used for feed, 1,506,000 tons, or 3.6 per cent, are burned, 3,011,000 tons, or 7.2 per cent, are sold off the farm, and 2,928,000 tons, or 7 per cent, are

used for feed. The average value was estimated at \$4.57 per ton, or a value of \$191,136,000 for the total oat straw production. The grain and straw production of the oat crop of the United States in 1915 represented a total value of approximately \$746,705,000.

OBERLIN COLLEGE. An institution for higher education founded at Oberlin, Ohio, in 1833. The total enrollment in all departments in the autumn of 1915 was 1689. The faculty numbered 175. There were no notable changes in the faculty during the year, and no noteworthy benefactions were received. The productive funds amount to about \$2,700,000, and the annual income to about \$125,000. The library contained some 150,000 bound, and 131,000 unbound, volumes. The president is Henry C. King, D.D.

OBESITY. A new method of dietetic treatment for the reduction of fat has been advocated, which promises to be much more efficient and controllable than the methods heretofore in vogue. This consists in repeated short periods of fasting which are controlled by observing the output of aceto-acetic acid and other substances which characterize the condition known as acidosis. It is well known that starvation prolonged over a period of more than a few days may lead to such unpleasant symptoms as headache, nausea, and the like, which are immediately relieved by taking even a very small quantity of food. Folin and Denis applied this observation, interrupting the period of complete starvation by a period of moderate feeding, just sufficient to eliminate the acetone bodies from the urine, after which the fast was taken up again. During the second period acidosis did not show itself until the third day of the fast. Another period of low diet succeeded, and a third fast was begun five days later. Here the onset of acidosis was even more delayed than during the second fasting period. These results apparently indicate that a perfectly safe and rapid method of reducing the weight of overfat persons is by a series of repeated fasts of increasing length, determined by the amounts of ammonia or beta-oxybutyric acid excreted.

OBSERVATORIES. See *ASTRONOMY, New Observations.*

OCCUPATIONAL DISEASES. In connection with the problem of industrial accidents much attention has been given in recent years to diseases connected with occupations. It has come to be generally recognized that such diseases constitute an evil of the same class as industrial injuries and that provision should be made against them by the same methods. Consequently detailed studies are being made of the diseases peculiar to particular industries, the work conditions which cause them, and the means of reducing their frequency; and at the same time workmen's compensation laws are including occupational diseases along with accidents as constituting a basis for legal claims.

LEGISLATION. Rhode Island enacted a law requiring every physician attending a person believed to be suffering from poisoning by lead, phosphorus, arsenic, brass, wood alcohol, mercury, or other compounds, or from anthrax or compressed air illness or any other disease contracted as the result of his industrial employment, to report the name and address of such

patient and his employer, the occupation, the nature of the disease, and any other information required by the State Board of Health. A great many States passed various requirements designed to prevent industrial diseases. The Colorado and Montana laws in a broad general way required employers to provide safe places of employment in accordance with rules to be formulated by newly created industrial commissions. Illinois required that processes generating poisonous gases or dust should be carried on in rooms above the ground. Minor regulations were enacted in other States.

NEW YORK CITY. One of the most important developments in the investigation and treatment of occupational diseases was the organization by Dr. Goldwater, Commissioner of Health of New York City, of a clinic for occupational diseases, under the title of Division of Industrial Hygiene. Dr. Louis I. Harris was placed in control, and Mrs. E. H. Harriman paid for the services of four physicians to assist in investigations. In addition some 15 other physicians of the department coöperated. This division secured subjects for examination in various ways. Under the sanitary code all persons handling food or drink are subject to examination; various industries where irritating dusts, mercurial or other poisons exist, were brought into line either by approaching the unions where the trade was well organized, or by approaching the employers where unorganized. The first extensive investigation was of 889 out of about 4100 persons employed in 113 shops in the manufacture of fur garments, caps, gloves, and felt hats. All the various processes were carefully analyzed and a most comprehensive inquiry made into the effects of numerous special conditions. It was found that lung, throat, and nose inflammations were very frequent; that anemia existed in 67 cases; that skin lesions abounded; that tuberculosis was frequent; that mercurial poisoning existed in 40 cases; and that deafness due to catarrh resulting from dust was a common ailment. This was followed by the publication of a set of 17 recommendations specifying in detail the rules to be followed in order to eliminate faulty conditions in these industries. Similarly the division investigated and issued instructions setting forth the precautions necessary for printers in the safe-guarding of their health.

Another notable development was the organization of the Conference Board of Physicians in Industrial Practice for the purpose of "co-operative effort in introducing into industrial establishments the most effective measures for the treatment of injuries or ailments of employees; for promoting sanitary conditions in workshops; and for prevention of industrial diseases." Dr. John J. Morehead of New York City was chosen chairman and Mr. M. W. Alexander, West Lynn, Mass., executive secretary.

GREAT BRITAIN. A departmental committee appointed in 1911 to investigate the dangers to health of house paints containing lead reported May 5, 1915. It recommended the prohibition of the importation, sale, or use of any paint material containing more than 5 per cent of its dry weight of a soluble lead compound. Exception is made of artists' colors; and three years for readjustment of industry is allowed. Extensive inquiries were made into the scope and variety of lead poisoning. It was found that Austria, Germany, Holland, Belgium, France,

and Switzerland had already dealt with the problem. The committee stated that two modes of handling the situation were available, either regulation by a strict industrial code, or complete prohibition. The objections to regulation were its inadequacy, the difficulty of prohibiting dry rubbing down, the cost of complying with necessary precautionary measures, and impossibility of full enforcement. The committee found that leadless paints are already in extensive use for interiors, and that zinc-oxide paints are satisfactory for exterior work.

BUREAU OF LABOR STATISTICS. The United States Bureau of Labor Statistics is one of a multitude of agencies gathering information in this field. It publishes a series of bulletins entitled *Industrial Accidents and Hygiene*. In this list the following bulletins refer to occupational diseases: "Lead Poisoning in Potteries, Tile Works, and Porcelain Enameled Sanitary Ware Factories" (Bull. No. 104); "Hygiene of the Painters' Trade" (Bull. No. 120); "Dangers to Workers from Dusts and Fumes, and Methods of Protection" (Bull. No. 127); "Lead Poisoning in the Smelting and Refining of Lead" (Bull. No. 141); "Lead Poisoning in the Manufacture of Storage Batteries" (Bull. No. 165); "Industrial Poisons Used in the Rubber Industry" (Bull. No. 179). The result of these investigations, as of others, has been to show that scarcely any industry is free from the peculiar hazards represented by poison, dust, fumes, gases, or working conditions which result in disease or the undermining of the physical constitution. In consequence Federal workmen's compensation laws which were before Congress during 1913-15 included occupational diseases equally with industrial accidents.

OHIO. The Ohio State Board of Health issued a report on "Industrial Health Hazards and Occupational Diseases," which was the result of a two-year investigation under the direction of Dr. E. R. Hayhurst, who conducted a similar survey in Illinois in 1910. Nearly every industry is described in all respects in which it affects health, including light, ventilation, cleanliness, injurious dusts and gases, unguarded machinery, fatigue from great exertion or from speed or monotony, and wages. This was believed to be the most thorough inquiry in the subject made by any American State.

OCEAN FREIGHT. See SHIPPING.

O'DONOVAN, JEREMIAH. An Irish patriot, better known as O'Donovan Rossa, died June 29, 1915. He was born in 1831 at Rossa-Carbery, County Cork, Ireland. His father was of a Rossa or "Red" branch of the family, so called. His parents were poor, and he received little early education. As a boy he spoke Gaelic, but learned English in young manhood, and educated himself to a great extent. During the famine times in the 40's his family emigrated to America, leaving him in the care of relatives. He established a grocery business, and was appointed an official to assist in local relief, under the English poor law system. Even as early as this he had become an uncompromising patriot. In 1856 he joined the Phoenix Society, which was formed as a literary organization, but acquired new characteristics when James Stephens came from Paris and began secretly to organize the original revolutionary brotherhood. The Phoenix Society became a revolutionary society and O'Donovan was one of its most active workers. The new

leum. There were produced in 1914 73,631,724 barrels, compared with 63,579,384 barrels in 1913. The total value of the production in 1914 was \$57,253,187, compared with \$59,581,948. During the year 8292 wells were completed, of which 6410 produced oil.

The coal produced in 1914 was 3,988,613 short tons, valued at \$8,204,015. This was a decrease of over 4 per cent in quantity, and about 4 per cent in value in the production of 1913, and was due to the displacement of coal by petroleum and gas as a fuel, following the remarkable increase of oil production in Oklahoma and Texas. There were employed in the coal mines of the State 8078 men. There were 31 fatal accidents during the year. The total value of the State's mineral production in 1914 was \$78,744,747, compared with \$80,168,820.

TRANSPORTATION. The total mileage of railways in the State in 1915 was 6456. The roads having the longest mileage are the St. Louis and San Francisco, 1497; the Chicago, Rock Island, and Pacific, 1326; and the Atchison, Topeka, and Santa Fe, 850.

EDUCATION. The total school population of the State in 1914 was 587,134. The enrollment on June 30, 1914, was 496,908. The average daily attendance was 322,117. The male teachers numbered 3214, and female, 7604. The expenditures for the schools in that year were \$7,879,906.

CHARITIES AND CORRECTIONS. The State penal and charitable institutions are Oklahoma State Orphans' Home at Pryor, Confederate Home at Ardmore, Hospital for Insane at Vinita, Hospital for Insane at Supply, Hospital for Insane at Norman, School for Blind at Muskogee, Institute for Feeble-minded at Enid, State Training School for Boys at Pauls Valley, School for Deaf and Dumb at Sulphur, Industrial School for Girls at Chickasha, Industrial School for Deaf, Blind, and Colored Orphans at Taft, Training School for Negro Boys at McAlester, School for Wayward Incurable Girls at Oklahoma City, State Penitentiary at McAlester, and State Reformatory at Granite. The total expenditures for the maintenance of these in 1915 were \$1,073,664. The Legislature of 1915 enacted a widows' and orphans' pension law. It also enacted measures providing for the pensioning of Confederate soldiers and sailors.

POLITICS AND GOVERNMENT. On June 21st, the United States Supreme Court declared unconstitutional the "grandfather" clause in the Constitution which disfranchised a large percentage of negroes.

STATE GOVERNMENT. Governor, R. L. Williams; Lieutenant-Governor, M. E. Trapp; Secretary of State, J. L. Lyon; State Auditor, E. B. Howard; Attorney-General, S. P. Freeling; State Treasurer, W. L. Alexander; Superintendent of Public Instruction, R. H. Wilson; Commissioner of Charities and Corrections, William D. Matthews. They are all Democrats.

JUDICIARY. Supreme Court: John B. Turner, Summers Hardy, Matthew J. Kane, J. F. Sharp, and G. A. Brown.

STATE LEGISLATURE:

	<i>Senate</i>	<i>House</i>	<i>Joint Ballot</i>
Democrats	38	77	115
Republicans	5	17	22
Socialists	1	4	5
Democratic majority	32	56	88

OLD AGE PENSIONS. The developments in the movement for the establishment of old age pension systems in 1915 were not striking. There was continued discussion in the United States concerning the establishment of some sort of general system patterned after those in force in England, Germany, France, or the Australian Commonwealth, but the developments were solely in the field of retirement allowances for public employees, or for corporation employees. Thus in six cities and towns of Massachusetts, the question of granting retirement pensions to civil employees appeared on the ballot in the State election in December. The immediate question was whether the legislative representatives should be instructed to support an old age pension measure. The answer was a vigorous affirmative—the percentages voting for it being: Cambridge, 81; Brockton, 87; Lawrence, 79; Methuen, 75; Abington, 77; Whitman, 83.

The Boston Chamber of Commerce went on record as opposed to any extensions of non-contributory public pensions. A committee of the chamber reported that there are about 200,000 people in Massachusetts over 65. If 70 per cent qualified to receive the pension, as was the case when it was established in England, it would mean an expenditure of \$5,000,000 a year from public funds. Based on the present assessed valuation of \$9,000,000,000, this would mean an increase of approximately 60 cents a thousand in the local tax rate.

The inauguration of retirement systems for their employees has been a notable feature of the development of the industrial organization of large firms in the United States during the past few years. Such systems are now found in all the principal railway companies and the better established industrial concerns. The Winchester Repeating Arms Company instituted such a system in July, 1915, for about 12,000 persons. After working for the company 30 years a male employee may be retired upon request at 55 years. A woman working 30 years may be retired at 50 upon her request. The company at its discretion may retire and place on the pension list any employee 60 years of age, who has worked for the company 25 years, or any female employee of 55 years, who has worked for a similar period. The amount of the pension is to be based on the employee's average annual pay during five years immediately preceding retirement, but no pension is to be less than \$20 a month.

A bulletin was issued by the Pennsylvania Railroad system containing the names of 57 men who had been placed upon the company's pension list. Altogether 8881 had been put on the pension roll, of whom 4467 were living. Since the roll of honor and retirement plan was established, Jan. 1, 1900, the system has paid out nearly \$11,500,000 in pensions.

CANADA. In Canada the government carries out a plan whereby individuals may provide annuities for their later years. The expenses of administration are borne by the state, and in addition the premiums are calculated on the basis of a rate of interest slightly higher than the normal market rate, thus giving another indirect contribution from the government. There is no direct contribution by the government. From Sept. 1, 1908, to March 31, 1915, 3700 annuity contracts were written under the government plan. This system, however, does not

reach the laborer nor the artisan in large numbers, attracting persons of moderate income, such as clerks and school teachers. A change in the method of propaganda in 1911 from lecturing to advertising resulted in a great decrease in the number of applicants, a result attributed by many to the advertising method now used.

AUSTRALIA. Under the Invalid and Old Age Pensions Act of Australia, 1909, there were on June 30, 1915, 111,309 pensioners, of whom five-sixths were old age and one-sixth invalid pensioners, to whom a total of \$13,097,000 was paid. The average pension per two week period was about \$4.75, the same as in 1914. Administrative expenses were 1.77 per cent of the total payments made, or a fraction of 1 per cent less than previously.

FRANCE. Old age and invalidity pension acts were passed in France, 1886, 1898, and 1910. On Jan. 1, 1914, the number in receipt of pensions was 362,876; they received an average annual pension of \$25.48. Compared with five years previous there was an increase of only 56,100 in the number of pensioners, and of 20 cents only in the average annual compensation.

OMAN. An independent Mohammedan state in Southeastern Arabia. Estimated area, 82,000 square miles; estimated population, 500,000. The capital is Muscat; its population, including that of the adjacent Muttra, is about 25,000. Imports in 1912-13, 6,953,363 rupees, and exports, 4,522,163 rupees; in 1913-14, 6,116,520 rupees and 4,073,044 rupees. Chief imports in 1913-14: rice, 1,984,654 rupees; piece goods, 832,300; coffee, 390,150; twist and yarn, 321,790; arms and ammunition, 202,902. Chief exports in 1913-14: dates, 1,508,676 rupees; fish, 113,608; cotton goods, 204,200; limes, 90,275. These figures are only for sea-borne trade; in addition, there is a large unrecorded caravan trade with the interior. Reigning Sultan, Seyyid Timar bin Faisal, who was born in 1886 and succeeded his father, Seyyid Faisal bin Turki, on Oct. 5, 1913. British consul and political agent in 1915, Lieut.-Col. R. A. E. Benn, C. I. E.

ONTARIO. A province of the Dominion of Canada. The area is 407,262 square miles; the population (1911), 2,527,292. (See CANADA, section *Area and Population*.) The capital is Toronto, the second largest city in the Dominion, having, in 1911, 376,538 inhabitants. Ontario is administered by a Lieutenant-Governor, who is appointed for five years by the Governor-General of Canada, and who acts through a responsible executive council. The Legislative Assembly consists of a single chamber of 106 members popularly elected for four years. Lieutenant-Governor in 1915, Lieut.-Col. Sir John S. Hendrie, appointed Sept. 26, 1914. Premier, W. H. Hearst. See CANADA.

OPERA. See MUSIC.

OPTIONAL CHARTERS. See MUNICIPAL GOVERNMENT, section so entitled.

OPTOPHONE. See PHONOPTICON.

ORANGE FREE STATE. A province of the Union of South Africa since the formation of the Union, May 31, 1910. The area is 50,389 square miles, nearly equivalent to the combined area of New York and Rhode Island, which is 50,450 square miles. The population at the 1911 census was 528,174, of whom whites numbered 175,189. The capital is Bloemfontein, which had in 1911 26,925 inhabitants, of whom 14,720 white. Adherents of the Dutch Reform Church

in 1911 numbered 175,311; Wesleyans, 88,857; Anglicans, 42,401; Presbyterians, 7549; Congregationalists, 8368. Persons recorded as of no religion, 173,336, of whom 173,192 native and other colored. There are reported 691 public and 211 aided private schools, with an enrollment of over 30,000 pupils. Stock raising is the principal industry, though the production of grain is increasing, especially in the eastern districts. In 1913, the number of sheep was 10,060,053, and goats, 616,113, as compared with 10,443,922 and 804,254 in 1912; horses in 1911 numbered 220,725, and cattle, 1,286,234.

ORCHESTRAS. See MUSIC.

ORDNANCE. See MILITARY PROGRESS.

ORDUNA, THE. See NAVAL PROGRESS, *Naval Operations in 1915*.

OREGON. POPULATION. The estimated population of the State on July 31, 1915, was 809,490. The population in 1910 was 672,765.

AGRICULTURE. The acreage, production, and value of the principal crops estimated by the United States Department of Agriculture in 1914-15 were as follows:

		Acreage	Prod. Bu.	Value
Corn	1915	33,000	1,155,000	947,000
	1914	22,000	660,000	541,000
Wheat	1915	900,000	20,025,000	16,821,000
	1914	799,000	16,604,000	16,986,000
Oats	1915	365,000	16,060,000	5,942,000
	1914	64,000	12,740,000	5,788,000
Rye	1915	28,000	414,000	378,000
	1914	21,000	336,000	336,000
Barley	1915	130,000	4,680,000	2,902,000
	1914	122,000	3,660,000	2,238,000
Potatoes	1915	48,000	5,520,000	8,312,000
	1914	49,000	4,753,000	2,852,000
Hay	1915	850,000	41,870,000	17,765,000
	1914	858,000	1,716,000	15,787,000

a Tons.

LIVE STOCK. The United States Department of Agriculture estimated that on Jan. 1, 1916, and Jan. 1, 1915, horses numbered 295,000 and 304,000, valued at \$26,255,000 and \$27,360,000; mules numbered 10,000 and 10,000, valued at \$930,000 and \$960,000; milch cows numbered 216,000 and 210,000, valued at \$11,880,000 and \$13,355,000; other cattle numbered 553,000 and 503,000, valued at \$17,807,000 and \$18,259,000; sheep numbered 2,563,000 and 2,563,000, valued at \$13,328,000 and \$11,534,000; swine numbered 396,000 and 360,000, valued at \$2,812,000 and \$3,420,000. The production of wool in 1915 and 1914 was 15,763,000 and 15,600,000 pounds respectively.

MINERAL PRODUCTION. The total production of gold in 1914 was \$1,591,461, compared with \$1,627,710 in 1913. The mined production of silver in 1914 was 142,542 ounces, a decrease of 36,484 ounces over 1913.

The coal production in the State in 1914 was 51,558 short tons, valued at \$143,556, an increase of 5445 tons compared with the output of 1913. It was the largest production since 1910. Coal has never been one of the important productions of the State, and during the last years it has decreased because of the larger increase in the production of petroleum in California, and in its use as fuel. The value of the total mineral production in 1914 was \$3,331,132, compared with \$3,563,919.

TRANSPORTATION. The total length of railway main line in the State on June 30, 1914, was 2039. In addition there were 999 miles of branches and spurs. The railways having the

longest mileage are the Oregon-Washington Railway and Navigation Line, 537; the Southern Pacific, 436; and the Oregon Tramp Line, 156.

EDUCATION. The total school population in 1914 was 202,389. The total enrollment in the public schools was 133,819, with an average daily attendance of 115,205. The total number of teachers was 5751, of whom 4650 were females, and 1101 males. The total expenditures for educational purposes were \$7,199,471.

CHARITIES AND CORRECTIONS. The charitable and correctional institutions include the Oregon State Hospital, the Oregon State Penitentiary, the State Institution for the Feeble-minded, Oregon State Training School, Oregon State Tuberculosis Hospital, Oregon State School for the Blind, Oregon State School for the Deaf, all at Salem, the Eastern Oregon State Hospital at Pendleton, and the Oregon State Soldiers' Home at Roseburg.

POLITICS AND GOVERNMENT. At a special election held on January 20th, Miss Katheryn Clark, Democrat, was elected State Senator, defeating two men opponents. Miss Clark had been previously appointed to fill a vacancy by Governor West. She was the first woman elected to the Oregon Senate. The Senate on February 3rd passed a bill repealing capital punishment. This was to conform to the constitutional amendment, which was adopted in the general election in November, 1914.

A resolution providing for a constitutional amendment making it unlawful for aliens to own land in the State was defeated in the House of Representatives on February 4th by an almost unanimous vote. Another bill providing for the submission to the voters of an amendment repealing a constitutional provision giving white foreigners the same rights with regard to property as native born citizens was also defeated.

In accordance with the vote of the people in November, 1914, the Lower House of the Legislature on February 4th passed by a vote of 58 to 2 a bill prohibiting the sale or manufacture of liquor within the State except for sacramental purposes. By the measure physicians are permitted to administer liquor personally, and the importation of two quarts monthly is allowed to individuals for private consumption. The bill was also passed by the Senate, and was signed by the Governor. It becomes effective Jan. 1, 1916.

The House on February 1st passed a measure providing for the permanent registration of voters, and containing provisions which amount to compulsory voting. Under these provisions the clerks are required to keep a card index system, for registered voters. When once a person registers the record becomes permanent. County clerks are required to remove any person's name from the registration list who has not voted within two years. A measure was passed forbidding discrimination between male and female public school teachers in the payment of salaries.

On March 29th the Oregon and California Railroad Company petitioned to the United States Supreme Court to reverse the decision of the Federal District Court, which forfeited the railroad's title to 2,300,000 acres of land estimated to be worth \$50,000,000. The forfeiture was claimed by the government because of a clause in the grant requiring the railroad to sell the land to "actual settlers" at not more than \$2.50 an acre. The counsel for the railroad

claimed that all rights of the United States to forfeit had been lost by inaction on the part of the government. The Supreme Court on June 21st, enjoined the railroad company from selling the undisposed portion of its land grant. The sale to "actual settlers" in 168 acre tracts at \$2.50 an acre is permitted under the decision, after suitable legislation has been enacted by Congress. The court refused to forfeit the lands to the government on account of the company's failure to comply with the provisions as to prices and settlement, and also denied the application of "actual settlers" who have settled on the land without permission of the railroads, and of applicants for entry, to have the property declared a trust in their behalf.

The Sunday closing law of the State which had been on the statute books for many years without any effort being made to enforce it, was declared invalid on November 6th, on the ground that it specified that certain lines of business should not be conducted on the "Lord's Day." The court held this to be religious discrimination.

STATE GOVERNMENT. Governor, James Withycombe, Republican; Auditor and Secretary of State, Benjamin W. Olcott, Republican; State Treasurer, Thomas B. Kay, Republican; Superintendent of Public Instruction, J. A. Churchill, Republican; Adjutant-General, George A. White; Attorney-General, George M. Brown, Republican; Commissioner of Insurance, Harvey Wells.

JUDICIARY. Supreme Court: Chief Justice, Frank A. Moore; Justices, Robert Eakin, Thomas A. McBride, Henry J. Bean, George H. Burnett, Lawrence T. Harris, and Henry L. Benson; Clerk, J. C. Moreland.

STATE LEGISLATURE:

	Senate House Joint Ballot		
Republicans	28	56	84
Democrats	2	4	6
Republican majority	26	52	78

OREGON, UNIVERSITY OF. A State institution for higher education, founded at Eugene, Oreg., in 1876. There were enrolled in the fall of 1915, in the department of liberal arts, 786; in the summer school, 183; in the school of medicine, 81; in the school of music, 139; and in the correspondence study school, 442. The faculty numbered 119. There were no notable changes in the membership of the faculty during the year, and no noteworthy benefactions were received. The university is supported almost entirely by legislative appropriations. The productive funds amounted to \$201,998. The library contained approximately 60,000 volumes.

ORGANIC CHEMISTRY. See CHEMISTRY.

ORION NEBULA. See ASTRONOMY.

ORNITHOLOGY. In the United States and Canada, the agitation for bird protection has been continued, and the Legislatures in 40 States passed 240 new laws relating to this subject. Only in Arizona, Georgia, and Nebraska was no action taken. On Jan. 1, 1915, a law prohibiting the importation of wild bird skins for commercial purposes went into effect over the whole of Canada. In England *Bird Notes and News* reported gratifying progress in bird protection, mentioning specifically the resulting increase in the number of skua colonies on the Shetland Islands. The Dutch colonies on the Malay Peninsula have prohibited the shooting of the rarer

birds of paradise, the only ones not now protected being the lesser bird of paradise, the twelve wired bird of paradise, and the rifle bird. In England the war prevented the final passage of a plumage prohibition bill through Parliament.

The Audubon Society reported a distribution of 6,000,000 pamphlets and leaflets, and an expenditure for the society for the year of \$90,000. Mr. H. K. Job is in charge of a new department on applied ornithology, whose aim is to instruct the public in methods of attracting wild birds and raising game birds.

As reported in the *YEAR BOOK* for 1914, the last known living passenger pigeon died in September, 1914. It was sent to the Smithsonian Institution, where it was studied by Schufeldt, who has published detailed descriptions and photographs of its anatomy in the *Auk*.

The 33rd meeting of the American Ornithological Union was held in San Francisco, May 17th to 20th, 1915.

In the report of the Smithsonian Institution, Strong republished some observations previously noted in the *Auk* on the habits of the herring gulls in Green Bay and Lake Michigan. The species is gregarious, though there are frequent quarrels among the birds, and other birds are not disturbed when nesting on small islands also occupied by the gulls. They choose breeding places on islands inaccessible to man, though in hunting food they are often found near human habitations. They rarely breed before they are three years old. The young are fed on food regurgitated on the ground, and thus may be fed by birds other than their own parents. The gulls are omnivorous, though they prefer fresh meat, eating spoiled meat only when driven to it by hunger. They do not dive to any extent, and never plunge into the water as do the terns. They do much bathing in warm weather, but very little in cold. Hearing and vision are both good, and vision is good at night. Strong thought he could distinguish between "challenge" and "alarm" calls.

Cooke in the *Year Book of the Department of Agriculture*, discussed the question of the rapidly approaching extermination of the shore birds of the United States and laid the blame largely on the insufficiency of the United States laws relating to spring shooting. In addition to this, their winter homes in the Argentine are destroyed by the clearing of the land, and the cultivation of the Mississippi Valley limits their feeding grounds. Most shore birds nest near the Arctic and winter as near the Antarctic as they can find suitable feeding grounds. The two most important to the sportsmen are Wilson's snipe and the woodcock. These are indifferent as far as agriculture is concerned, and hence are of chief value to sportsmen, but by reason of injudicious shooting the woodcock especially have been largely exterminated. Sportsmen themselves are arguing for a closed season to extend over several years. The woodcock does not migrate so far south as some other shore birds but is found in large numbers in the southern United States, where it is especially liable to be exterminated by "game hogs."

According to Cooke, a number of shore birds migrate from Alaska to Hawaii at a single flight, in most cases doing this in one night, though the Pacific golden plover probably takes 48 hours. It was estimated that less than two

ounces of fuel in the form of fat is used up in this process and Cooke estimated that to be equally efficient a 1000 pound aeroplane should fly 20 miles on one gallon of gasoline. The Eskimo curlew formerly occurred in enormous flocks, breeding in the northern part of Canada and wintering in Southern Argentina and Northern Patagonia. They are now nearly exterminated owing to hunting in Argentina and in Texas and Kansas on their migrations; and to the fact that their breeding grounds are being used for agriculture. The only way to prevent extermination is the adoption of Federal laws prohibiting spring shooting.

Willet stated that in Alaska the tufted puffin will dive after herring used as bait by fishermen, even going down 15 fathoms after it. The spread of the chestnut blight in the eastern United States is largely laid to the carrying of spores by birds, especially the downy woodpecker and brown creeper.

A second list of birds prepared by the British Ornithological Union appeared in 1915. Collinge, writing on British birds, insisted that in estimating whether a given species is injurious or beneficial one must secure information concerning its food throughout the year. Most birds are carnivorous during the time when they are feeding their young, and this is decidedly beneficial to the farmers. He thinks that the wood pigeon is the worst pest with which the English farmer has to contend. On four British lighthouses bird perches have been provided.

Beal reported on the habits of robins and bluebirds in the United States. Robins may sometimes clean out an entire cherry crop before the fruit is ripe enough for human use, and in California do much damage to the olive crop. Beal thought that they do this only when there is an insufficient supply of wild fruits to meet their needs. Bluebirds eat insects almost entirely, and sometimes do harm by eating predaceous beetles.

O'ROURKE, JEREMIAH. American architect, died April 23, 1915. He was born in Dublin, Ireland, in 1833, and was a member of a family long prominent in the affairs of the Irish capital. He was educated in the Christian Brothers' School and studied architecture in the Government School of Design. In 1850 he removed from Ireland, and settled in Newark, N. J. For several years he was employed in drawing plans for buildings, and later went into business for himself. He designed the Church of the Immaculate Conception in Camden, several churches in Newark, and Seton Hall College in South Orange. In 1893 he was appointed supervising architect for the Treasury Department of the United States government. He supervised the building of many important post offices and other public buildings.

OROYA FEVER, or CARRION'S DISEASE. This disorder was studied by Strong, Tyzzer, and Sellards, of the Harvard School of Tropical Medicine, who found it prevalent in the deeply cleft valleys of the western slope of the Peruvian Andes, at altitudes of 2500 to 8000 feet. They suspect it occurs in other tropical countries. It has, like malaria, seasonal prevalence, favoring the period from January to April, and particularly toward the end of a warm rainy season. The disease is characterized by a fever of generally irregular course, rapid and pernicious anemia, prostration, and, in from 30 to 75 per cent

of the cases, death in three or four weeks. Diarrhœa frequently occurs. Restlessness, insomnia, and delirium may develop. In cases complicated with verruga, an eruption appears. The most striking feature is the change in the blood, since the red blood cells are invaded by the parasite which causes the disease, in the authors' opinion, the *Bartonella bacilliformis*. Consult *Journal of the American Medical Association*, March 6, 1915.

OSBORNE, THOMAS M. See PENOLOGY, *Osborne and Sing Sing*.

OSTRICH FEATHERS. See AGRICULTURE.

PAHANG. A state (the easternmost) of the Federated Malay States (q.v.). Tin and gold are mined; agriculture is the chief industry. A line of railway from Gemas in the Negri Sembilan to Kuala Semantan in Central Pahang (70 miles) was completed in June, 1911, and is being extended to the Kelantan frontier. Roads are in process of construction. Kuala Lipis, 209 miles upstream from the mouth of the Pahang River, is the administrative headquarters. The native Sultan, Mahmud bin Almerhum, resides at Pekan and is advised by a British resident, who in 1915 was Mr. E. T. Brewster.

PAINTING AND SCULPTURE. The war in Europe will doubtless have a significant effect on the American art world. As yet developments are slight, but there are unmistakable signs of changes that are likely ultimately to prove very important factors in the development of painting and sculpture in the United States. Dealers who formerly conducted their operations in London and Paris, with only a casual and superficial attention to the American market, are now making their headquarters in New York. Many American artists, who have lived for years abroad, are returning to their native land, adding their work to the volume already produced here, and a considerable number of foreign artists, unable to weather the storm in Europe, are taking refuge in America.

To a certain extent this increased importance of America in art may be temporary, but it can hardly be doubted that so marked a movement will have a considerable permanent effect. American collections are rapidly growing in numbers and importance, both the collections of modern art and of old masters.

EL GRECO AND GOYA EXHIBITION. A significant demonstration of how necessary a knowledge of American collections is becoming to students of the painting of the past, was given in the Loan Exhibition of pictures by El Greco and Goya, which took place in January, 1915, for the benefit of war sufferers. Only in Toledo and Madrid could be found so important a group of examples of the art of El Greco. Among them were included the portrait of Cardinal Don Fernando Nifo de Guevara, "View of Toledo," portrait of Anstagi, San Martin and Virgin with Saints from the Church of San José in Toledo, "Christ Cleansing the Temple," and "Christ on the Mount of Olives." It was a revelation to see together so many splendid El Grecos all belonging to American collectors.

The pictures by Goya, though numerous and excellent, were not as thoroughly representative of his genius as those by the greater master, but there were some very fine examples among his portraits, notably "Countess de Altamira and Daughter," "The Conde de Teba," and "The Little Lady." Various collectors contributed to this

extraordinary exhibition which was one of the great events of the year and immensely appreciated, especially by artists.

Since El Greco is the "old master" of the moderns, it was perhaps fitting that the exhibition of his work should happen to be followed by that of one of their contemporary prophets, namely Henri Matisse. The display, which did not show Matisse at his best, was of interest chiefly in that it indicated, in a somewhat different fashion and more fully than had been done formerly, to the New York public, one of the sources of those innovations in painting which had mystified them in the followers of Matisse, whose work they had already seen. Other phases of the modern movement, as manifested in present day French art, were shown from time to time in group exhibitions throughout the winter.

ARCHITECTURAL LEAGUE EXHIBIT. The first large general exhibition of the year was that of the Architectural League. This event of annual recurrence is the most important opportunity offered to the public to gain an idea of the attainments of the American architect and the artists most closely affiliated with him. The Panama-Pacific and the Panama-California expositions at San Francisco and San Diego respectively, being the largest recent undertakings in which painters, sculptors, and architects have coöperated on a comprehensive decorative scale, naturally played a conspicuous part in the exhibition.

Designs for these buildings were shown, as well as sketches for decorative compositions, by Robert Reid, William Dodge, Edward Simmons, and Frank Vincent Dumond, while a section of Robert Aitken's "Fountain of Earth" was one of the exhibits to prove that the part played by the sculptors in the adornment of the Exposition would be fully as prominent as that played by the painters. It did in fact turn out to be more so. A portion of a simply designed and very beautiful fountain by Edith Woodman Burroughs was one of the best things in the exhibition, and there were in fact many other items by a good proportion of the sculptors who have made a name for themselves in America. Many eminent architects showed records, of a kind necessarily more or less unsatisfying, of their achievements, and there were a great number of decorative works of all sorts having about the same general interest as those which are shown every year in this particular exhibition. A room was devoted to the work of the men from the American Academy at Rome, illustrating the manner in which they carried out the difficult problems prescribed for them.

PENNSYLVANIA ACADEMY. The Pennsylvania Academy was the next important organization to take the field, its 110th exhibition being opened to the public in Philadelphia early in February. As is naturally the case in an exhibition where the majority of the pictures are invited, a large number of works appeared which had been seen before, either in other general exhibitions or in smaller groups.

The sculpture prize was awarded to Albin Polasek for a small bronze called "Aspiration," beautifully designed and modeled with large simplicity of form. Other exceptional works of sculpture were by Emil Zettler, and Albert Laessle. Charles Hopkinson won the portrait prize, and others to receive honors were Carroll Tyson,

Charles Hawthorne, William Paxton, and Gertrude Lambert.

Practically all the artists of established reputation throughout the country were represented, as well as many others whose names are less generally familiar. Among the artists whose reputations, now in the making, were increased by the work which they contributed to this occasion, may be mentioned Arthur B. Carles, Waldo Pierce, Harry Berlin, and Joseph Sachs. Pictures which helped to establish the standard of the exhibition were by Thomas Eakins (a painter who late in life is receiving the appreciation merited by his undaunted sincerity), George Bellows, Robert Henri, Hayley Lever, Alden Weir, Frank Benson, Paul Dougherty, Emil Carlsen, George deForrest Brush, William Chase, Cecilia Beaux, Maurice Prendergast, William Glackens, Elmer Schofield, Ernest Lawson, Childe Hassam, and Frederick Frieseke.

NATIONAL ACADEMY EXHIBIT. Following the Pennsylvania Academy came the Spring Exhibition of the National Academy in New York. An exceptionally large number of pictures were shown, and the arrangement, though crowded, was homogeneous, for the new school men were debarred even more rigidly than usual. Practically no painting of the experimental sort was allowed to disturb the quiescent aspect of the walls. The Saltus medal was given to Abbott Thayer for one of his winged figures. Eugene Speicher won the first Hallgarten prize, and Randall Davey the second Hallgarten prize, while the portrait prize went to Douglas Volk. The Inness gold medal was awarded to Joseph Pearson.

ASSOCIATION OF AMERICAN PAINTERS AND SCULPTORS. This organization, which three years ago promised great things, has unfortunately dwindled into a state of pretty complete inactivity owing to internal dissension. A remnant of it, whose most influential member is Arthur B. Davies, held an exhibition in a dealer's gallery in March. This was not without interesting features, but was notable chiefly as definitely marking the end of the broad and catholic policy which belonged to the organization when it first came into being.

DEGAS EXHIBIT. On April 6th an exceptionally good loan exhibition was opened for the benefit of the campaign for woman suffrage. This exhibition was made up of paintings and pastels by Edgar Degas and Mary Cassatt, largely from the collection of Mrs. H. O. Havemeyer. It was an occasion that lovers of painting were glad to take advantage of, as opportunities to see the work of Degas are by no means frequent, practically all of his pictures in this country being in the hands of private collectors. While Miss Cassatt's work is more accessible she is not a general exhibitor. Examples of the work of both artists, representing all the stages of their long and distinguished careers, were shown, and the reason for the high position which both have won in nineteenth century art was made more clear than ever before in America. At the same time, with the work of these two notable moderns, was exhibited a smaller group, also from private collections, of pictures by old masters including Vermeer, de Hooch, Holbein, Coello, Bronzino, Rembrandt, and Rubens.

The motive that guided the arrangement of the gallery of old masters beside the one occupied by Degas and Mary Cassatt involved an in-

teresting and too little tried experiment. The old masters, or at least some of them, were chosen to show the sources of the two moderns, and to show their connection with the general tradition of painting. And for those people, constitutionally and tiresomely inclined to think of modern painting as necessarily something secondary to any examples of the older masters, it was a healthy thing to see for themselves two moderns who stood up so strongly and in some cases outshone their predecessors.

BLAKESLEE SALE. A large dealer's collection of old pictures was dispersed in the Blakeslee sale which took place in April. It was by no means a collection of masterpieces, being made up largely of first rate examples of second rate artists, and second rate examples of first rate artists; but there was an ample supply of the sort of canvases that architects frequently find useful to complete the decorative scheme of a handsome room.

A very large "Adoration of the Magi," elaborately authenticated as the work of Rubens, and showing some of his characteristics, was a prominent item, and there were works attributed to Bol, Metz, Van Orley, Titian, and a number of the lesser Italian masters. A group of Spanish pictures included specimens of Coello, Mazo, Goya, and Murillo, and there were a great number of portraits of the eighteenth century, both of the English and the French school.

PANAMA EXPOSITION EXHIBITS. Two events which mark 1915 as distinct from other recent years, were the Panama-Pacific Exposition, which took place in San Francisco, and the Panama-California Exposition, which took place in San Diego. At the latter the use of sculpture for the ornament of the buildings was entirely eliminated and the collection of paintings was comparatively small, consisting mainly of paintings by Robert Henri and others in sympathy with his ideals. The aim of the San Diego exposition was to exploit local tradition, while the Panama-Pacific was international in scope.

In the general arrangement of the San Francisco exposition works of sculpture played a very prominent part, many pieces appearing to good advantage placed in the open against a background of foliage. One of the most conspicuously placed works of sculpture was Hermon MacNeil's "Adventurous Bowman," which surmounted the striking Column of Progress. At the base of the same column appeared Isidore Konti's bas reliefs. Nude figures by Adolphe Weinman and four groups by Paul Manship adorned the Court of the Universe, and a "Victory," by Evelyn Longman, was to be found in the Court of the Four Seasons.

"The End of the Trail," by Fraser, was placed at the entrance of the Court of Palms, and fountain figures were contributed by Putnam, Aitken, and the late Edith Woodman Burroughs. Of the American sculpture shown in the Palace of Fine Arts, most of the pieces were already well known, and the foreign nations were represented by works of sculpture not only in the Palace of Fine Arts, but in the separate national pavilions. Among the French sculptors who contributed examples of their work were Rodin, Bartholomé, Bourdelle, Dalou, Mercié, and Bessard. The Italian list included Dazzi, Nicolini, Luppi, and Ferrari. Other countries represented were Holland, Norway, and Argentina.

The artists who received important commis-

sions for the mural decorations were William deL. Dodge, Frank Brangwyn, Edward Simmons, Robert Reid, and Childe Hassam.

The Palace of Fine Arts contained over a hundred rooms in which were exhibited American paintings as well as many examples of European art. Some critics found the American division disappointing, the hanging and arrangement of the pictures being less satisfactory than in some of the foreign collections. But the truth is that there were difficulties due to the war which resulted in a compulsory crowding of native work, as more foreign work arrived than had been expected after the war had started.

To a number of deceased painters the tribute of separate rooms or walls was accorded, among them being Homer, Abbey, Whistler, LaFarge, Twachtman, and Robinson. The living painters chosen to receive similar honors were Sargent, Chase, Melchers, Duveneck, Hassam, Weir, Redfield, and Tarbell. Others whose work played a prominent part were Friesseke, Cushing, Griffin, Bohm, Lever, and Tucker.

The French exhibit of painting was divided between the French pavilion, where pictures were shown by Manet, Beaudouin, Carrière, Puvion de Lavallée, Degas, Fantin-Latour, Moreau, Cazin, Renoir, Gauguin, Cézanne, and Toulouse-Lautrec, and the Palace of Fine Arts, where hung works by Blanche, Cottet, Daubigny, Roll, Maurice Denis, Le Sidaner, Simon, Signac, and Vallotton.

The Italian contribution was somewhat incomplete, but included pictures by Mancini, Innocenti, Tito, Mentessi, Emma Ciardi, and Lionne.

The Scandinavian division exploited painting of the advanced and independent type, as well as the more conservative. A whole room was allotted to Fjaestad, and the art of Bruno Liljefors was also illustrated by a considerable number of works. Other Scandinavian painters represented, either in the Palace of Fine Arts or in their respective official pavilions, were Strandberg, Ossund, Anna Boberg, Bergman, Krohg, Munch, Thaulow, Lund, Hammer, Exner, Roed, Ottesen, Hansen, Balgaard, Kyhn, Petersen, and Christiansen.

The collection of Dutch painting was unpretentious in character and contained no eccentricities, displaying the work of Blommers, Breitner, Witsen, Isaac Israels, Van Mastenbroek, and Wolter.

Spain did not officially participate, but there were a few pictures sent from Portugal. Other countries which were represented were Hungary, Argentina, Cuba, Uruguay, and the Philippines.

CHICAGO ART INSTITUTE EXHIBIT. Owing to the exhibition of foreign work at San Francisco, the Carnegie Institute at Pittsburgh did not hold its regular annual international exhibition in 1915.

But the 28th annual exhibition of American painting and sculpture took place as usual at the Chicago Art Institute. Alden Weir's beautiful portrait, "The Palm-Leaf Fan," deservedly won the Potter Palmer prize, and other awards went to Joseph Pearson, George Bellows, and W. Victor Higgins. An honorable mention was given to Chester Beach for his "Unveiling of Dawn," one of the leading contributions to the comparatively small group of sculpture. Over 350 paintings were shown, representing in characteristic fashion the art of Frederick Bartlett, one of the most talented of the Chicago painters, Benson, Beal, Mary Cassatt, Ralph Clarkson,

Davies, Hassam, and many others whose works very often go the rounds of the large exhibitions, appearing in each one in turn—to such an extent in fact that sometimes more than 50 per cent of the work shown in any one exhibition will already be familiar through its previous appearance in other exhibitions.

OTHER EVENTS. One of the important small exhibitions of the fall season was a group of paintings by Van Gogh which, considering the limitation in numbers, was quite remarkably representative, and was in consequence a matter of great interest to the more modern painters. And the most important exhibition of the late season took place at the same time and consisted of a very remarkable group of paintings by Renoir, supplemented by a number of fine Monets.

Owing to the fact that so many artists now live on this side of the Atlantic, the number of pictures submitted to the winter exhibition of the National Academy was unprecedented. Four or five times as many pictures were rejected as were accepted. The artists who won prizes were Garber, Beaux, Dougherty, Hawthorne, and Paul Herzel. But much the most interesting paintings from the painter's point of view were those shown by Glackens, Lawson, Prendergast, Charles Reiffel, and a few others who brought a fresh note with them to raise the level of mere efficiency which characterizes so much of the work of the men who exhibit year after year at the Academy.

One of the sculptors whose work showed above the general standard of the sculpture department was Edith Woodman Burroughs, whose death occurred in December. Her death is a very real loss to American art, as she was an artist of distinct achievement. An artist who was widely known as an active and hard working official as well as through his suave method of painting, John Alexander, also died this year. Two famous collectors died this year, Sir William Van Horne and P. A. B. Widener.

PANAMA. A republic situated between Costa Rica and Colombia. The city of Panama is the capital.

AREA AND POPULATION. The estimated area of the republic is 87,480 square kilometers (33,776 square miles), an area slightly larger than the combined area of New Hampshire, Vermont, Massachusetts, Connecticut, and Rhode Island, which is 33,384 square miles. Panama's area will be somewhat reduced if the Costa Rican boundary is delimited in accordance with the decision (announced in 1914) of Chief Justice White of the United States Supreme Court, to whom the boundary dispute had been submitted. The population is probably about 375,000 (exclusive of the Canal Zone). The population of the city of Panama was estimated in 1915 at 60,000, and of Colón at 30,000. Other important towns are David and Bocas del Toro. The Canal Zone, which is American territory, extends to a width of five miles on either side the middle of the Panama Canal, but does not include the cities of Panama and Colón. In 1915 it was reported, but erroneously, that the name of Canal Zone was changed to Panama Canal. The independence of Panama was recognized by Colombia in a treaty with the United States signed April 6, 1914, and ratified by Colombia in 1914, though up to the end of 1915 it had not been ratified by the United States.

The reported number of public schools maintained by the government was 364, with 14,511 pupils. The National Institute, for secondary and special instruction, was opened in the city of Panama.

PRODUCTION, COMMERCE, ETC. Panama is a fertile country, but only a small part of it is under cultivation. The principal crop is bananas. Other products of some importance are corn, sugar cane, cacao, yams, rice, coffee, tobacco, coconuts, and rubber. The forests contain some mahogany and other valuable woods. Mining and manufacturing are unimportant.

Imports (exclusive of non-dutiable supplies for the Panama Canal) and exports have been valued as follows:

	1910	1911	1912	1913
Impe..	\$10,056,994	\$9,896,988	\$9,871,617	\$11,397,000
Expe..	1,769,380	2,868,425	2,064,648	5,388,027

By far the largest article of export is bananas. Classified exports in 1912 were: vegetable products, \$1,829,336; animal products, \$229,245; mineral products, \$6066. Foreign trade is largely with the United States, the United Kingdom being second.

The city of Panama has rail connection with Colón, 48 miles; this is the Panama Railway, owned by the United States. A new railway in the Province of Chiriqui was under construction during the year and was to be completed in May, 1916. The new line has a total length of 62 miles, extending from the Pacific port of Pedregal, 300 miles north of the city of Panama, up to the head of the Caldera Valley at the foot of the Chiriqui volcano. In a distance of 33 miles from the sea coast the railway attains an elevation of 4500 feet with correspondingly high grades. The heavy precipitation during the rainy season made the construction of culverts, bridging, and drainage, as well as the roadbed, very costly. The track is 36-inch gauge and the total cost of the line was to be about \$1,760,000. In the region around Bocas del Toro, light railways, chiefly for the banana industry, aggregate upwards of 150 miles. Telegraph and post offices number about 40 and 100, respectively.

FINANCE. The monetary unit is the balboa, equivalent to the American dollar. Revenue and expenditure in 1911 amounted to \$3,366,470 and \$3,359,588 respectively. For the two-year fiscal period 1913-14, the budget balanced at \$7,682,428; for the following two-year period, \$10,622,000. Early in 1915 Panama's first foreign loan, of \$3,000,000, was negotiated in New York; the proceeds were to be used for railway construction. In the autumn of 1915 a loan of \$1,200,000 was authorized.

GOVERNMENT. The legislative power is vested in the National Assembly, a single chamber of 33 members elected by direct vote for four years. The President is elected for four years by direct vote and is ineligible for the succeeding term. There are three designates, elected by the Assembly to succeed, in order, to the presidency in case of vacancy. President for the term ending Oct. 1, 1916, Belisario Porras. Each of the provinces is administered by a governor appointed by the President.

HISTORY. Early in January, 1915, announcement was made that Panama had refused to accept the award made by Chief Justice White of the United States Supreme Court in the arbitra-

tion of the dispute over the boundary between Panama and Costa Rica. After approving the budget (*supra*) and passing the bill empowering the Executive to deport obnoxious foreigners (see YEAR BOOK for 1914), the National Assembly adjourned, Feb. 24, 1915. The insufficiency of the revenues to cover the expenditures contemplated under the new budget, especially since any increase of import duties was certain to encounter opposition in the United States, was regarded as one of the most serious problems confronting the government. Another cause of anxiety arose in April, when Corporal Langdon, of the United States coast artillery, was killed at Colón by the native police. Subsequently another American soldier was killed in a street fight in Panama. The negligence of the authorities in Panama in bringing the assailants of the Americans to justice evoked a strenuous protest from the United States. Public sentiment in Panama, according to current reports, bitterly opposed what appeared to be an attempt on the part of the United States to interfere with the freedom and independence of the police system of Panama; nevertheless, in September, the Government of Panama promised to give the United States full satisfaction, and instituted a judicial investigation of the two cases. Consult also PANAMA CANAL; UNITED STATES.

PANAMA-CALIFORNIA EXPOSITION. See ARCHITECTURE; and EXPOSITIONS.

PANAMA CANAL. In the annual report of Gen. George W. Goethals, Governor of the Panama Canal, dated Aug. 2, 1915, and covering operations up to the end of the fiscal year, June 30, 1915, it was stated that the total amount expended for the canal, including the balance of appropriations still on hand and available for work now in progress, was \$357,436,048, from which should be deducted receipts from the sale of construction material and equipment, and the value of buildings and plans transferred to the United States army and the Alaskan Railway Commission without charge, and various payments made to the Republic of Panama for municipal work in Panama and Colón. Of the \$394,399,149 appropriated by Congress to June 30, 1915, General Goethals, in his report, states that \$14,689,873 was spent on fortifications; \$750,000 to cover three annual payments to the Republic of Panama; \$6,440,000 for the operation of the civil government of the Canal Zone for the fiscal year 1916; \$4,289,159 for the operation and maintenance of the canal to the end of the fiscal year 1915, while stock on hand aggregated \$2,225,000, leaving \$365,999,116 appropriated for the actual construction of the canal and its adjuncts. Two million dollars of this was invested in colliers, and \$6,563,067 was returned to the Treasury Department up to the close of the fiscal year 1915.

According to the report, the current expenses charged to operation and maintenance of the canal during the fiscal year 1915 amounted to \$4,112,550.48, while \$160,608.52 had been charged during the previous year, a total of \$4,289,159. Tolls collected for vessels passing through the canal during the year amounted to \$4,343,383.69; tolls for the prior year amounted to \$14,618.68; a total of \$4,358,002.37 to June 30, 1915.

The report states: "The excess of tolls collected over the current charges for the year was \$214,833.21, and for the entire period to June 30, 1915, the excess was \$68,843.37. This, however,

does not represent the actual financial condition, for the attorney-general decided that the maximum tolls collectible on any vessel is the amount derived from the net registered tonnage under United States measurement rules, at \$1.25 per net ton, so that large refunds will have to be made, as the difference between the amount collected under the Panama Canal rules and the amount properly collectible under the law has been found to exceed \$1000 in the case of several vessels, and it is roughly estimated that the total refunds may aggregate \$400,000, which will show an excess of operating expenses over collections. Refunds cannot be made, however, until Congress makes an appropriation therefor, as the amounts collected as tolls were recovered into the Treasury as miscellaneous receipts. With the refunds the expenses would therefore exceed the receipts.

"The number of lockages made at Gatun during the year was 1216, of which 1066 were for commercial vessels; at Pedro Miguel, 1260 lockages were performed, of which 1085 were for commercial vessels; and at Miraflores there were 1236 operations, of which 1085 were for commercial vessels."

LINES USING CANAL. One of the features that stood out prominently in the operation of the Panama Canal during its first fiscal year was the fact that it had developed an all-water transcontinental traffic in many commodities which formerly could not be carried by all-rail or mixed water and rail routes, such as lumber. In the second place, it had increased the regular traffic of the Panama steamship lines by coast-to-coast cargoes, with the result that the competition was being felt by the railways, and these, notably the Southern Pacific, applied to the Interstate Commerce Commission for permission to reduce transcontinental rates both for all-rail and for mixed water and rail lines.

In the first fiscal year of the Panama Canal, the bulk of the westbound freight to California was engaged by the following lines: the American-Hawaiian Steamship Company, with a fleet of about 25 steamers; the Luckenbach Steamship Company, with a fleet of from 12 to 15 vessels; and the Atlantic and Pacific Steamship Company (of W. R. Grace & Company), with 7 or 8 steamers. In the 12 months ended June 30, 1915, these vessels carried in the aggregate 92.77 per cent of the cargo of westbound freight from the Atlantic ports to California. The vessels of these lines had a gross tonnage of 538,690 tons, as compared with a total tonnage of the smaller lines of 42,081.

Among the other lines using the Panama Canal regularly were the Harrison Line, operating vessels in approximately monthly service between Great Britain and Pacific ports of the United States and Canada, in connection with a direct line to and from Glasgow; the East Asiatic Company, with a monthly service from Copenhagen to Pacific ports of the United States and Canada; and the Maple Leaf Line, from New York to Vancouver, then to San Francisco, and from that port to Europe, returning to New York, with vessels sailing about every six weeks.

Between Europe and South America regular lines were maintained by the East Asiatic Company, between Copenhagen and Valparaiso and intermediate ports; by the Pacific Steam Navigation Company; and the Royal Mail Steam Packet Company, from Great Britain through

the West Indies as far as Valparaiso, affording a fortnightly service. From the United States to South America, the Merchants' Line, of W. R. Grace & Company, had sailings between New York and Chile once a month; and the New York and South American Line operated approximately a fortnightly service over the same route. The regular lines between the United States and the Far East were operated with more or less irregularity, but those in regular service were the Nippon Yusen Kaisha to Japanese ports and Vladivostok; the American and Manchurian Line (Ellerman and Bucknall Lines) between New York and Vladivostok; the American-Australian Line (also a branch of the Ellerman and Bucknall Lines) from New York to Australia and New Zealand; a joint service of the American and Oriental Line, Barber Line, Shewan, Tomes and Company, and the Indra Line, from New York direct to Vladivostok; the Prince Line from New York to the Far East; and the United States and Australia Steamship Company.

LOCKAGES. General Goethals stated in his report that the average time for locking vessels through the three locks at Gatun was 65 minutes; through the single lock at Pedro Miguel, 25 minutes; and through the two locks at Miraflores, 45 minutes. Four towing locomotives were generally attached to the ships, though eight are employed for the largest battleship. Tandem lockages with two ships in the same chamber at the same time had been made but were limited by the number of towing locomotives available. Parallel lockages were made only in emergencies.

WATER SUPPLY. The experience of the dry season of 1915 indicated that the need for anxiety over the risk of an inadequate water supply for the canal, which was displayed during the earlier days of the project, was indeed remote. The rainfall on the surface of Gatun Lake during the dry season practically equaled the loss by evaporation. It was found that instead of being obliged to lower the level of the lake during the dry season to supply water for lockages, enough water was wasted over the spillway during the freshets of February 9th, 10th, and 11th, and April 3rd and 4th alone to have raised the lake level 2.95 feet. The water-supply situation of the dry season of 1915 was summarized in tabular form as follows:

	Million Cu. Ft.
Total yield of Gatun Lake watershed.....	48,924
Evaporation from lake surface	9,427
Used for hydro-electric power	8,812
Used in making 988 lockages and tests	8,724
Used for municipal purposes and by suction dredges	279
Leakage	175
Wasted at the spillway	23,264

BALBOA DRY DOCK. At the end of the year the new dry dock at Balboa was nearly ready for use. This dock, which is excavated in rock, is 110 feet in width at the entrance, and 1044 feet long from the mitre sill to the head. The mitre and caisson sills are 39.5 feet below mean sea level. The dock contains, with the tide at mean sea level, 5,265,000 cubic feet of water. At the entrance of the dock are a pair of steel mitre gates identical with the Panama lock gates, except that the bearing surfaces at the mitre and

quoins ends are of green-heart instead of nickel steel. The first gate was hung on November 27th, and the second gate was practically completed at the end of the year.

DREDGING. In addition to digging away the slides, the dredging division was at work at both terminals of the canal. At the Pacific end, 542,000 cubic yards was dredged between deep water in Panama Bay and the Pacific entrance, and about 2,800,000 cubic yards was dredged from the Balboa inner harbor. At the Atlantic terminal 759,000 cubic yards was dredged from the Cristobal approach pier channel, and 265,000 cubic yards of coral rock was excavated.

CARGOES AND TOLLS. The use of the Panama Canal reached a maximum in July, 1915, when 170 vessels passed through and the cargo carried amounted to 705,469 tons, exceeding the shipments during any previous month. The tolls and earnings were greater than during any preceding month since the canal was opened to the public. Vessels from the Atlantic to the Pacific numbered 93, and carried 316,773 tons of cargo. Those from the Pacific to the Atlantic numbered 77 and carried 388,696 tons of cargo.

The British vessels outnumbered those of any other nation during July, amounting to 76, and exceeding the number of American ships by 21. The ships of other nations were: Swedish, 8; Japanese and Norwegian, 7 each; Danish, 5; Chilean, 4; Peruvian, 3; Honduran, 2; Argentine, Dutch, and French, 1 each. The tolls collected on vessels passing through the canal during July amounted to \$573,365.87; including the regular tolls on vessels of the United States government, which were not collected, the gross earnings in the month were \$606,578.77.

The principal commodities passing through the canal during July were cement, coal, coke, copper, cotton, general cargo, lumber, manufactured goods of iron and steel, machinery, railroad material, nitrates, crude oil, refined petroleum, sugar, tin, wire fencing, wool and zinc concentrates. Of these, nitrates of soda were the largest by a considerable degree. While the above items apply to but a single month, yet they can be considered typical of the year's business.

According to the *Canal Record*, a total of 6,706,915 tons of cargo was carried through the Panama Canal up to September 18th, when the canal was closed by slides. This was at the average rate of 496,808 tons a month, or 16,318 tons a day. From the time the canal was opened on Aug. 15, 1914, until closed, a total of \$5,754,673 was collected in tolls. The traffic through the canal by months since Aug. 15, 1914, is shown in the accompanying table:

During the first year of operation, ending Aug. 14, 1915, the canal passed a total of 1317 ocean-going vessels with an aggregate net tonnage, Panama Canal measurement, of 4,596,644, an average of 3490 net tons per vessel. The tolls earned were \$5,216,149. In comparison, the traffic through the Suez Canal for the calendar year 1914 is of interest, being 4802 vessels of 19,409,495 net tons. The total receipts were 125,121,237 francs, equivalent (at 19.3 cents per franc) to \$24,148,399. There was naturally a considerable falling off in the Suez Canal traffic in 1914 on account of the war, but the traffic was, however, about four and one-half times as great as that through the Panama Canal.

An interesting situation was developed during the year when, as stated above, it was realized that the rules for vessel measurement, adopted by Presidential proclamation, were not in accordance with the law, and the protest was made that tolls collected in excess of legal authority should be refunded. These rules were drafted by Dr. Emory R. Johnson, and were supposed to conform strictly to the law as enacted. General Goethals, in his report, says: "Much to our chagrin and humiliation, we learned that Dr. Johnson was aware of the discrepancy, notwithstanding which he presented his rules of measurement and rates of tolls for promulgation to the shipping interests of the world. Confusion has been the order of the day in consequence." In addition to the difficulty of providing for the refund of the illegal charges which must wait until a Congressional appropriation, the law as it stood involved the assessment of vessels on their net registered tonnage, which could be varied by rulings and decisions of the Commissioner of Navigation. These rules as applied were said to cause discrimination against American ships in favor of foreign ships.

SLIDES. The important event of the year at the Panama Canal was its closing on September 18th by great slides at Culebra, which involved some 10,000,000 cubic yards of material and required to be dredged out. This closing of the canal was a very serious matter, particularly in view of the demand for shipments to the Far East, with the conditions of oceanic shipping seriously affected by the war in Europe, and the threatened closing of the Suez Canal. The obstruction of traffic held up at the Isthmus 83 ships with vast cargoes and involved a delay that meant great financial losses in view of the scarcity of shipping and the need of prompt shipments. Some of the lines with ships on either side, of course, were able to transship via the Panama Railroad. These slides were not

Month	Atlantic-Pacific		Pacific-Atlantic		Total	
	Vessels	Cargo tons	Vessels	Cargo tons	Vessels	Cargo tons
August, 1914	18	49,106	11	62,178	24	111,284
September	27	141,762	30	180,276	57	322,038
October	44	168,069	40	258,288	84	421,357
November	54	206,510	38	242,291	92	448,801
December	43	179,235	57	271,219	100	450,454
January, 1915	44	208,082	54	240,925	98	449,007
February	39	150,987	53	276,078	92	427,065
March	57	217,447	80	417,610	137	635,057
April	59	237,884	60	285,457	119	523,341
May	67	246,534	75	332,174	142	578,708
June	83	320,619	60	282,561	143	603,180
July	93	316,773	77	388,696	170	705,469
August	89	249,119	72	326,218	161	575,337
September	49	181,880	51	274,937	100	456,817
Total	761	2,878,007	758	3,838,908	1,519	6,706,915

a new feature of the canal. They were incident to the geological formation of the ground and were encountered during the construction, and even during the operations of the French Company at Cucaracha. The sliding began early and continued until 1912, when for a time there was no further trouble at this point. Before the great slide of September 18th, three minor slides had interrupted traffic, the canal having been closed from Oct. 14 to 20, and Oct. 31 to Nov. 4, 1914; and from March 4 to 10, 1915.

The breaks at the Culebra Cut first occurred in 1907, and followed intermittently ever since. The great slide began in 1914 on the east bank north of Gold Hill, but until August, 1915, dredges were able to keep up with the movement and to keep the canal clear. On September 18th a disastrous slide occurred at Gaillard Cut on the east bank just north of Gold Hill, directly opposite the village of Culebra, which put the canal out of commission, and prevented its use for the remainder of the year, except for the passage of a few small vessels on December 20th. These ships were all less than 20 feet draft and their passing through did not indicate the restoration of a condition of navigation or indicate when such would be established definitely.

The Panama Railway, whose facilities were taxed during the time the canal was closed to all traffic, was temporarily buried by an earth slide about 2 miles north of Pedro Miguel on October 31st, which involved about 200 feet of track, and closed the road to traffic. This slide was caused by unusually heavy rains. The changed conditions on the Isthmus made necessary a readjustment of freight rates.

FUTURE DREDGING. On Oct. 26, 1915, when General Goethals submitted a very full report on the slides, he stated that an estimated amount of 7,000,000 cubic yards would have to be removed before the slides were entirely done away with, but under certain conditions this amount might reach 13,000,000 cubic yards, with a probable correct estimate between the two limits of about 10,000,000. On October 6th, General Goethals stated that the length of the channel that was blocked was 1300 feet, and by suitable dredging this had been reduced to 700 feet at the time of his report, but even then it was impossible to break through the closure at one point which was then about 100 feet in length. The work of dredging on these slides was being prosecuted with the greatest vigor, being carried on even on Sundays and holidays, and the engineering staff made a constant record of the progress and the change of conditions.

The excavation of the Culebra slides proceeded at the rate of about 250,000 cubic yards per week, and in October the total amount taken from the slides was 872,952 cubic yards. Elsewhere in Gaillard Cut about 200,000 cubic yards was excavated, making the total excavation for the month 1,079,863 cubic yards, a yardage that later was increased to 1,250,000. A new 15-yard dipper dredge, *Cascadas*, was hastily assembled and completed on October 30th, starting to work on October 31st. While there was rapid progress with the dredging it was not completed at the end of the year sufficiently to reopen the canal to traffic except for the passage of the few small vessels on December 20th, already noticed.

COMMISSION. At the request of President Wil-

son, the National Academy of Science designated a scientific commission to investigate the subject of slides on the Panama Canal and to make a report to the President concerning them. The members of the commission were: Charles R. Van Hise, president of the University of Wisconsin; Brig.-Gen. Henry L. Abbot, U. S. A. ret., hydraulic engineer, of Cambridge, Mass.; John C. Branner, president of Leland Stanford, Jr., University; Whitman Cross, of the U. S. Geological Survey; John F. Hayford, director of the college of engineering, Northwestern University; Harry F. Reid, professor of geology at Johns Hopkins University; Dr. Charles D. Walcott, president of the Smithsonian Institution; Rolla C. Carpenter, professor of experimental engineering, Cornell University; Arthur P. Davis, chief engineer U. S. Reclamation Service; and John R. Freeman, consulting hydraulic engineer, of Providence, R. I. The commission sailed for the Canal Zone late in the year, arriving on December 19th, and conducted an examination of the slides, investigating the geological formations and the attendant circumstances.

Bibliography. Among the many reports, volumes, and articles dealing with the Panama Canal in the technical and general press, mention may be made of the *Construction of the Panama Canal*, by William L. Sibert, brigadier-general, U. S. A., division engineer, Panama Canal, 1907-14, and John F. Stevens, chief engineer, 1905-07. Valuable papers on the Panama Canal were also presented before the International Engineering Congress at the San Francisco Exposition and were published in the record of that meeting.

PANAMA EXPOSITIONS. See EXPOSITIONS; and PAINTING AND SCULPTURE.

PANAMA-PACIFIC EXPOSITION ART EXHIBITION. See PAINTING AND SCULPTURE.

PAN-AMERICAN FINANCIAL CONFERENCE. See BRAZIL, *History, Relations with the United States*.

PAN-AMERICAN SCIENTIFIC CONGRESS. This congress, which was the second of the sort to be held, convened in Washington on December 27th. There were present many of the most distinguished scientists, educators, and publicists of the United States, and of the Central and South American states. Eduardo Suarez, the ambassador of Chile, was president of the congress. The discussions at the conference included practically every subject in the range of human activities. Its purpose was the correlating and exchanging of new views, where they had Pan-American bearing, in science, art, and the conduct of human affairs generally, with the aim of furthering the progress of civilization.

The scientific discussions began on December 28th, with the semi-formal openings of the nine main sections of the congress. These sections, on December 29th, divided into 45 sub-sections, each with its special topics. From that time to its end, the congress consisted of a large number of separate meetings. At the congress there were present more than 650 members of the faculties of the leading colleges and universities, and more than 350 scientific and commercial bodies were represented. On December 28th, Elihu Root delivered a notable address urging the protection of the weak nations against the strong by the adoption of international rules of right conduct. He urged that a moral code be formulated for adoption by the world. The ses-

sions of the Congress were to continue into January, 1916. See SOCIOLOGY.

PANCALISM. See PHILOSOPHY, *Metaphysics*.

PAPEN, CAPT. FRANZ VON. See UNITED STATES AND THE WAR.

PAPER. The paper industry in 1915 was in a condition of considerable uncertainty, as various elements due to the war, world politics, and economics, not to mention local influences, not only brought important changes of conditions, but boded uncertainty for the immediate future. The American industry in particular, which had been seriously affected by the tariff, suffered from increased prices for raw materials, especially chemicals and coloring matters. It was feared that possible embargoes in Europe, especially in the Scandinavian countries, might change the situation at any time, while the cutting off of raw materials and chemicals made curtailment of certain classes of stock necessary. American exports of paper continued at about the same rate in 1915 as in 1914 and 1913, the figures for 10 months, available when the YEAR BOOK went to press, showing a striking similarity. The imports of paper and paper materials were about normal, and went back to what they were before the tariff was reduced, permitting access for raw materials to American markets.

One estimate of the paper business in 1915 was made of \$64,634,000, as compared with \$58,758,000 in 1914. There was a revival of the box board trade and a general increase in prices, which customers were disposed to meet. The total newsprint for 1915 was estimated at 1,640,000 tons, or an increase of 36,000 tons over 1914. American paper manufacturers were particularly concerned with dumping policies and means for counteracting this that might be developed by Congress. In many cases paper and pulp men were hardly satisfied with the tariff treatment received at the hands of the National Legislature, and they were vitally concerned with steps that would be taken in the business crisis that might develop after the war.

One of the largest new plants proposed was at Bryant, Mich., where it was decided to erect a mill and machinery costing about \$450,000, an important feature of which would be two 154-inch Fourdrinier machines, one 154-inch Fourdrinier machine having been installed by this company about five years previously. The addition would give them a very large equipment.

The paper laboratory at the Bureau of Standards, Washington, was busy during the year both with its extensive routine testing and with the development of methods for testing and determining standards and qualities of paper. One investigation of interest was to find some way of ascertaining the permanence of paper, about which little positive information is available. The recovery of waste paper and the use of domestic casein were also subjects of inquiry at the Bureau, and various other researches were under way in charge of the head of the laboratory, Mr. F. C. Clark. The proposal to establish a casein industry in the Middle West in the extensive dairy districts was welcomed by paper manufacturers, as considerable of this material is used in paper making, as well as in artificial ivory, buttons, piano keys, and similar work. Particularly, this would be favorable to the manufacturers of Wisconsin, as their mills were in proximity to grazing districts where it was proposed to build such plants.

During the year the Department of Agriculture published a bulletin showing that large quantities of flax straw annually are destroyed that possess paper making possibilities never before realized. Flax is raised extensively in the Middle West for its seed, from which linseed oil is manufactured, with an annual crop amounting to 20,000,000 bushels of seed, valued at approximately \$33,000,000. This crop also yields approximately 1,600,000 tons of straw, but of this amount only about 200,000 tons are put to profitable use, though the remainder possesses paper making possibilities equal to the annual production of wrapping paper, and more than double the annual production of writing paper in the United States. The sale of this substance would yield the farmers an added annual income of about \$5,000,000, and would add materially to the importance of the flax crop. The domestic flax tow can be used in the manufacture of fibre counter boards which are now used largely in shoe factories.

Towards the end of the year there was a shortage of pulp wood in the United States, and large supplies of pulp wood and pulp were imported from Canada. Naturally the Canadian mills were very busy, and they were expecting increased calls for their product from Great Britain in view of the war condition.

During the year the paper industry in Great Britain had its uncertainties though the mills were supplied with orders in excess of their facilities for execution, due principally to lack of labor. There was an increase in prices and cost of production, which, however, did not affect the demand to any marked degree. There was a decrease of material exported from Great Britain, while imports were invoiced at higher prices. An increase of prices for raw materials imported, and the cutting off of the supplies of chemicals, also had their effect. Though foreign competition was omitted, the exports were light.

In Germany certain paper mills were actively engaged in making cellulose for explosives, and while the activity of these mills restricted the product, yet their return to the manufacture of paper at the close of the year was a consideration of economic importance. Pulp wood in Germany during the year was in increased demand, but notwithstanding this fact enough was available, though little could be said as to the outlook for the future. In certain of the occupied districts of Russia raw material was available and was being considered as a possible source of supply.

As a result of a discussion in Austria of the more extended uses of paper, and possible uses of paper as a substitute for cloth, which was published late in 1914, in 1915 an exhibition was held of paper substitutes in which some 50 exhibitors were represented, and while the exhibition was only open for five days, it attracted considerable attention, and some 20,000 persons were in attendance. The use of paper for clothing aroused particular interest, and numbers of paper socks were sold and distributed, while cellulose wadding, which had been employed as a surgical dressing, especially in the medical services of the Teutonic allies, began to find extensive application for linings of quilts, coats, and similar purposes. While the use of paper as a protective coating for the body was not novel, as paper vests had been on the market for some years, yet it was found that paper cuttings

could be used for this purpose when placed between linings, and also for filling bolsters, pillows, and feather beds, as they were superior hygienically, and, of course, were available for the poorer classes. Roll paper was used as a substitute for sheets, and more particularly as an underlay for sheets, protecting the cloth and the mattress, as well as diminishing wear. See also **CHEMISTRY, INDUSTRIAL, Paper-Making.**

PAPUA, TERRITORY OF. Formerly **BRITISH NEW GUINEA.** The southeastern part of the Island of New Guinea, forming with numerous small islands lying mostly to the southeast, a dependency of the Commonwealth of Australia. The area of the dependency is stated at 90,540 square miles. The native population has been variously estimated at from 250,000 to 400,000. Population, June 30, 1914: Europeans, 1186; colored (other than Papuan), 3934. Port Moresby is the capital. The local industries are not numerous, but they are becoming more diversified. The soil is favorable to agriculture. On March 31, 1914, plantations aggregated 42,291 acres. There were 29,030 acres under coconuts, 6606 under rubber, and 3110 under sisal hemp. About 350,000 acres are estimated to be under native-owned coconuts; a British ordinance obliges the natives to plant coconuts for food supply.

Gold mining is an important industry, and copper mining shows rapid increase. Imports and exports in 1912-13, £218,323 and £128,016; in 1913-14, £212,134 and £123,140. Exports of copper ore in the two years, £18,997 and £19,733. The gold output was valued at £62,112 in 1911, £64,115 in 1912, and £41,422 in the year 1913-14. Other exports are pearls (£9284 in 1912-13), copra, sandalwood, rubber, etc. Tonnage entered and cleared at the ports in 1913-14, 358,506. Local revenue and expenditure in 1912-13, £48,356 and £85,170; in 1913-14, £54,703 and £81,095.

PARAGUAY. A South American republic, bounded by Bolivia, Brazil, and Argentina. The capital is Asunción.

AREA, POPULATION, ETC. Paraguay proper, lying between the Paraguay and Upper Paraná rivers, has an estimated area of 253,100 square kilometers, slightly smaller than the State of Wyoming. The republic claims a nearly equal area in the Chaco region, between the Paraguay and Pilcomayo rivers; this territory is also claimed by Bolivia. The disputed territory has a very sparse population. The population of Paraguay proper is not definitely known. It has been estimated at 800,000, but some observers believe this figure is too large. The people are largely a mixture of Spanish, Guarani, and negro, but there are many persons of pure, or nearly pure, Guarani blood. Estimated population of the larger towns: Asunción, 84,000; Villa Rica, 30,000; Concepción, 25,000; Carapeguá and Luque, each 15,000. There are few immigrants—1440 are reported for 1913.

Elementary instruction is free and nominally compulsory. The number of elementary schools in 1914 is reported at 1124, with an enrollment of 68,937 pupils—39,930 males and 28,987 females. The average attendance was 57,431—33,275 for males and 24,156 for females. There are three national colleges (secondary schools)—one at Asunción, with 37 teachers and 645 students; one at Villa Rica, with 7 teachers and 68 stu-

dents; and one at Villa del Pilar, with 6 teachers and 77 students.

PRODUCTION AND COMMERCE. The country is suited to the cultivation of many tropical and all subtropical products. The principal crops are yerba maté, corn, beans, tobacco, alfalfa, manioc, and various fruits, especially oranges. Cotton and sugar cane also are grown. Grazing is an important industry, but might be considerably developed. The number of cattle is estimated at about 4,000,000. There is little mining or manufacturing.

Values of imports and exports have been reported as follows, in thousands of pesos (peso = 96.47 cents):

	1909	1910	1911	1912	1913	1914
Imports	3788	6248	6479	5283	8120	5149
Exports	5137	4785	4829	4211	5631	4584

The leading imports are cotton goods, food-stuffs, and hardware. For 1912 the principal exports were: hides, 1,082,646 pesos; woods, 877,037; yerba maté, 500,998; tobacco, 442,400; fresh fruits, 1,283,962. The imports have been chiefly from Germany and the United Kingdom. More than half the exports are to Argentina.

COMMUNICATIONS. In 1913 the length of railway in operation was 468 kilometers (291 miles). Asunción has rail connection with Encarnación (376 kilometers, or 234 miles), on the Upper Paraná. From Encarnación trains are ferried to the Argentine town of Posadas. From Borja, a little south of Villa Rica, a branch line is under construction, ultimately to reach a point on the Upper Paraná opposite the Brazilian town of Iguassú. There are about 2500 miles of telegraph line and 385 post offices.

FINANCE. The peso gold as a money of account is equivalent to 96.47 cents. No gold, however, is in circulation, and the paper peso is current at about 5 cents. In 1913 the revenue amounted to 1,508,143 pesos gold and 44,062,013 pesos paper; in 1914, 694,178 gold and 41,315,527 paper. Paraguayan budgets seem to have little relation to the eventual revenue and expenditure. For 1915, the estimated revenue was 1,951,200 pesos gold and 20,643,600 pesos paper; estimated expenditure, 603,805 gold and 50,499,410 paper. Import duties form the largest item of revenue.

The outstanding foreign debt, as reported for Dec. 31, 1914, £719,350; internal debt, March 31, 1914, £1,080,535 (including 65,000,000 pesos paper in circulation).

GOVERNMENT. Under the constitution the executive authority is vested in a President, who, with a Vice-President, is elected for four years by indirect vote. There is a Legislature of two chambers, the Senate and the Chamber of Deputies. Senators number 13 and are elected for six years by direct vote; deputies, 26, for four years. President for the term ending Aug. 15, 1916, Eduardo Schaerer; Vice-President, Pedro Bobadilla.

HISTORY. Colonel Escobar, minister of war in the cabinet, resigned his portfolio in January as a protest against the reductions effected by President Schaerer in the expenditures of the army department. Later in the same month Colonel Escobar instigated a revolt against the government, and actually succeeded in capturing the President, and confining him in the barracks at Asunción. The government police, however,

with the aid of the gunboat *Constitución*, speedily quelled the revolt, forced the mutineers to surrender, and released the President. More than 75 rebels were killed in the skirmish; the remainder either surrendered or took refuge in the Brazilian and Uruguayan legations. As a result of the serious derangement of commerce and finance by the war in Europe, the Paraguayan Congress was convoked in extraordinary session in June to extend the moratorium which had been declared in August, 1914, and would have expired on Aug. 31, 1915. By the new Moratorium Act, obligations falling due between Aug. 14, 1914, and March 31, 1915, were extended 290 days. Exceptions were made in respect of obligations arising from non-interest-bearing deposits, bank deposits made after Aug. 14, 1914, interest earned from July, 1914, wages and salaries, and other obligations contracted since the promulgation of the law. Towards the close of the year the Radical party began its campaign for the elections of 1916; Señor Manuel Gondra, it was stated, was proposed as the Radical candidate for the presidency, and Dr. Manuel Franco for the vice-presidency.

During 1915 the Senate of Paraguay approved, with some slight modifications, the concession granted to the firm of Guggiari, Goana and Company for the construction and operation of a railway from Horquetá, in the northern part of the republic, a point already in railway communication with Concepción, a city on the Paraguay River, to Pedro Juan Caballero, on the Brazilian frontier.

PARASITES. See ENTOMOLOGY, *passim*.

PARCEL POST. See UNITED STATES, *Post Office*.

PARK COLLEGE. A co-educational liberal arts college at Parkville, Mo., founded on May 12, 1875, by Rev. Dr. John A. McAfee (died 1890), its first president, and Col. George F. Park (died 1890), who gave the first land and buildings for its occupancy and for whom it was named. The college is unique among American institutions of higher learning in that the school is managed almost wholly on a coöperative basis whereby the students, by their own earnings, pay most of their own expenses. Among the industries carried on there, under the supervision of superintendents, are a dairy, an orchard, truck garden, farm, canning factory, electric light plant, water works, laundry, bakery, and heating plant. In addition, the students do all the work of taking care of the college grounds and buildings. The women students do the college clerical and library work, and prepare and serve the meals in the college dining-rooms. The total enrollment in both college and preparatory departments at the opening of the fall session in 1915 was 412 students, and the teaching staff consists of 24 members. The college owns 1100 acres of land, and its buildings, which, for the most part, were built by student labor, include a Carnegie Library (gift of Andrew Carnegie); Copley Hall (gift of Mr. and Mrs. William Thaw, Pittsburgh); McCormick Chapel (gift of Mrs. Nettie McCormick, Chicago); and Charles Smith Scott Astronomical Observatory, and Waverly Hospital (gifts of Anthony Dey, New York). The college equipment is worth \$105,984, and the invested funds amount to more than \$500,000. In 1915 Rev. Dr. Frederick W. Hawley was installed as the new president of the college. There are 943 alumni.

PARKER, SIR GILBERT. See LITERATURE, ENGLISH AND AMERICAN, *Fiction*.

PARKER, JOSEPH BENSON. American rear admiral, retired, died Oct. 21, 1915. He was born in Carlisle, Pa., in 1841, and graduated from Dickinson College in 1860. He studied medicine at the Bellevue Hospital Medical College in New York City. In 1863 he was appointed assistant surgeon in the United States navy. He advanced through various ranks to that of medical director and retired with the rank of rear admiral in 1903. He served in several stations, and in various navy yards and hospitals. He was one of the organizers of the Loyal Legion.

PARSONS, JOHN EDWARD. American lawyer, died Jan. 16, 1915. He was born in New York City in 1829, and in 1848 graduated from New York University. After four years of law study he was admitted to the bar in 1852. Two years later he formed a partnership with Lorenzo B. Shepard, and in 1857 the firm was changed to Mann and Parsons. The firm of Parsons, Shepard and Ogden was organized in 1880, and was reorganized in 1902. Within a few years of his active practice Mr. Parsons became one of the most prominent lawyers in New York City. He was identified with much important litigation. Through his work in connection with the American Sugar Refining Company, the so-called "sugar trust," he became widely known. He was a close friend and adviser of Henry Havemeyer, president of that company, and he served as its legal adviser from its incorporation in 1891 until 1910. The American Sugar Refining Company was organized to take over the controlling interests in several large sugar concerns. Its right to do this was attacked by the government under the Sherman law, and was defended by Mr. Parsons, who undertook to show that the action of the sugar company contemplated no restraint of trade. He won in all points, and on Jan. 21, 1895, the United States Supreme Court affirmed the decision of the lower courts in his favor. Following this, the sphere of the influence of the sugar corporation under the advice of Mr. Parsons extended rapidly until 1908-09, when extensive frauds in the weighing of sugar were discovered, and the company was obliged to make restitution to the government. As a result of the investigation of the company's affairs which followed these disclosures, the officials of the company, including Mr. Parsons, were indicted for conspiracy to establish a monopoly. The indictment was returned on July 1, 1909, and six months later Mr. Parsons handed in his resignation as counsel for the company. His trial began on July 1, 1912. He was at that time 83 years old. The trial resulted in a disagreement, and was not retried. In addition to his legal work, Mr. Parsons was active in religious and philanthropic activities, and was a member of the board of directors and an official in many hospitals, and social and educational societies.

PASCOITE. See MINERALOGY.

PATENTS. During 1914 and 1915 acts were passed by Parliament which empowered the British Board of Trade to confer upon British subjects the right to manufacture articles under patents which had been granted previously in favor of residents of Germany, Austria, or Hungary. The law did not apply to a patent which had been granted to a non-enemy proprie-

tor. In one case where a British firm had held a license to sell a German machine prior to the war the comptroller-general of patents issued a license to the applicants in which the licensees agreed to pay the patentees a royalty of 2½ per cent during the existence of the license.

PAYER, JULIUS VON. Austrian explorer and painter, died Aug. 31, 1915. He was born in Bohemia in 1842, and after receiving a military education was attached to the general staff. A survey of some of the most difficult regions of the Alps was made under his direction. In 1872 he was one of the leaders of the Austrian expedition to the North Pole, which discovered Franz Josef Land. On his return he retired from military service, and devoted his time to painting. He was awarded many gold medals for paintings of Arctic subjects.

PAYSON, W. F. See LITERATURE, ENGLISH AND AMERICAN, *Fiction*.

PEABODY MUSEUM. During 1915 the museum continued active work in various fields. Dr. E. A. Hooton, curator of somatology, spent the summer in archaeological work in the Canary Islands in the interest of the African department of the museum. An archaeological reconnaissance was made of the Island of Tenerife, many plundered graves of the Guanches (the original inhabitants) being investigated, and several undisturbed burial places discovered. The work was prematurely stopped by the intervention of the Spanish provincial government, instigated by an article which appeared in a local newspaper of anti-American tendencies. A portion of the collections which had been made were seized. Active work thus being stopped, the remainder of the season was spent in studying the Guanche collection in the Museum of Santa Cruz de Tenerife. More than 450 unstudied crania were measured, and objects of Guanche art and industry were photographed. It is hoped that permission will be obtained from the central government before the summer of 1916 to continue the work and to recover the collections already made.

Dr. A. V. Kidder, curator of North American archaeology, prepared an exhaustive paper upon the pottery of New Mexico, basing his studies upon the collections in the museum. He obtained leave of absence to direct the extensive excavations undertaken at the Pueblo of Pecos by the Department of Archaeology of Phillips Andover Academy.

In September, Oric Bates, curator of African archaeology and ethnology, left on an expedition to Marsa Matruh, the Libyan Desert, and perhaps Abyssinia, and it is expected that Dr. F. H. Sterns, associate in anthropology in the museum, will leave for archaeological investigations under Bates's direction. It may be noted that in connection with the work under the charge of Curator Bates, the faculty of the museum has approved the plans proposed by him for a new series of publications dealing with African subjects. There are now in preparation for the new series a Nubian grammar by G. W. Murray; a report by Dr. G. A. Reisner on the excavations at Kerma; a report on a collection of crania from Siwah Oasis by Dr. D. E. Derry of London University; and a volume of miscellaneous papers by various hands.

S. J. Guernsey, assistant curator of archaeology and ethnology, spent five weeks in the field

during the summer in Marsh Pass in Northwestern Arizona. The main object of his expedition was the excavation of a cave discovered and partly explored by Dr. Kidder in 1914. This work was successfully carried out, and two other similar caves and a small cemetery were also excavated. Preliminary plans were made of two cliff houses, and a large number of photographs were taken. The collections obtained from the season's work are of much interest, and include not only material of types not previously represented in the museum, but also many specimens which are unique in the archaeology of the Southwest. Guernsey was assisted in the field work by Dr. R. G. Fuller, assistant in anthropology in 1913-14, and by J. W. Edwards.

Dr. R. E. Merwin was in charge of the Central American Expedition for the season of 1914-15, as he had been during the previous year. He was assisted in the work of the expedition by A. W. Carpenter, Harvard Fellow in Central American Research. After a preliminary trip to Santa Rita, in Northern British Honduras, exploration was carried on in the Peten district of Guatemala in the vicinity of Yokonal, about 45 miles southwest of Benque Viejo. Three new sites were found in this area. The last half of the season was spent in exploring the coastal region southwest of Belize. A large group of ruins, comprising about 35 structures, was found on the Rio Grande to the north of Punto Gorda. Maps, plans, and photographs were obtained, and three interesting carved stones were brought back to the museum. Carpenter spent some time during the summer in the investigation of an Ojibwa village site on the Shiawassee River in the southern peninsula of Michigan. He was able to obtain a small collection of crania and other objects, together with ethnological information gathered from the surviving Indians, and obtained a large amount of historical data in regard to the site and its former inhabitants, by research in the State archives.

Dr. F. H. Sterns continued, during the summer of 1915, his archaeological explorations in the Missouri Valley, and despite most unfavorable weather conditions, obtained excellent results. Further study was made of the stratified site in Cass County, Neb., discovered in the previous year, and excavations were carried on at several old Kansas village sites in Kansas, and in Pawnee village sites in Nebraska.

Ernest Volk continued the work in the Delaware Valley which he has been carrying on for more than 25 years. During the spring Volk made a short stay in Cambridge for the purpose of studying some of his collections.

PEACE. See INTERNATIONAL PEACE AND ARBITRATION.

PEAT. See CHEMISTRY, INDUSTRIAL, *Utilization of Peat*.

PELLAGRA. This disease seems to be on an increase in certain Southern States. According to a bulletin recently issued by the Mississippi State Board of Health, there were 10,954 cases reported in 1914, as against 6991 in 1913, although part of this increase is thought to be due to more careful reporting and recognition of the disease. There were 1192 deaths in 1914, as against 795 in 1913. The most notable work undertaken as to the control and etiology of pellagra was that by Goldberger, of the United States Public Health Service, who holds that

pellagra is not a communicable disease, that it is dependent on faulty nutrition, and that pellagra does not develop in those who consume a well balanced and varied diet. Goldberger and his associates have succeeded in producing pellagra experimentally in a group of human beings, and further reinforced their theory by curing and preventing the malady among three groups of persons, in widely separated localities, by dietary measures alone. The first of these experiments was undertaken at two orphanages in Southern Mississippi, during the spring and summer of 1915. One of these institutions had 79 cases of pellagra among its 200 inmates, the other 130 cases among 220 inmates. The diet of inmates of both of these institutions was supplemented by increasing the amount of fresh animal and vegetable protein foods. After 14 months' observation it was shown that with reform in diet there was recurrence in only one case, and no new cases developed subsequently. In the second experiment, beginning in the summer of 1914 in the Georgia State Sanatorium, about 40 white and colored insane adults who had had pellagra were placed in separate wards and given a supplemented diet similar to that described above. None of the patients developed their usual recurrence during the following year, 1915, whereas during the same period 15 of 32 control female pellagrins living under similar conditions, excepting for diet, developed recurrences. Goldberger and Wheeler, in order to test further the relation of diet to pellagra, undertook to produce the disease among convicts who volunteered for the purpose on the promise of a pardon. There were 12 volunteers, besides 70 controls. There had been no previous history of pellagra at this camp. A preliminary observation of two months without change of diet showed that these convicts were free from pellagra. They were then placed upon a special diet, consisting of biscuits, grits, rice, fried mush, brown gravy, sweet potatoes, cabbage, collards, and cane sugar, equivalent to 3.32 pounds per man per day, and having a caloric value of 2,952 per man per day. No vegetable fats entered into the diet. Of the 11 volunteers who completed the experiment, six developed pellagra, showing skin lesions and nervous and gastrointestinal symptoms. These experiments seem to demonstrate that pellagra is a disease of nutrition, but they do not incriminate any single article of food, and it is not thought likely that any particular article will be found responsible.

A statistician of the United States Public Health Service made a study of the prevalence of pellagra and its possible relation to a rise in the cost of food. His investigation leads him to conclude that the difficulty of obtaining certain foods is responsible for the increase of the disease in certain Southern States, particularly those in which cotton mills employ a large proportion of the wage earners. The diet of poor Southern families is considerably less than that of Northern families, and the proportion of carbohydrates and fat is notably greater among the Southern families. This condition had been intensified since 1907 on account of industrial depression. Wages have gone down, whereas the retail prices of food have increased, being at least 40 per cent higher for proteins than for carbohydrates and fats. Pellagra may be a deficiency disease like beriberi and scurvy.

Many new remedies for pellagra have been tried, but without wide or convincing evidences of their usefulness. Among other interesting procedures antoserotherapy has been used by Palmer and Secor of Texas, who reported very flattering results. Their technic is very simple. A small piece of cantharides plaster is smeared with olive oil and placed on the chest at bed time; by morning a blister will have developed. The plaster is now simply lifted at one corner, a hypodermic needle introduced into the blister, and 1 c. c. of serum withdrawn and immediately injected into the arm. A larger dose than this seems to aggravate the symptoms. One c. c. given once a week seems to produce the best results.

Attempts to find a specific organism still continue. Sanders in 1914 withdrew the spinal fluid from a pellagrin who had just died from pellagra, exhibiting marked cerebral symptoms. Part of the fluid was incubated and another part examined. From both specimens a similar organism was isolated which was kept alive by cultivation on blood serum. From another case of pellagra showing marked skin lesions, Sanders obtained the same organism, and kept it growing on a special medium consisting of saturated corn meal and agar bouillon rendered faintly acid with hydrochloric acid. From this case he also obtained the organism from the spleen. A large number of fecal smears from pellagrins in the diarrheal stages of the disease, also showed large numbers of the same highly motile and characteristic organism.

PENANG. One of the Straits Settlements (q.v.).

PENNSYLVANIA. POPULATION. The estimated population of the State on July 31, 1915, was 8,383,992. The population in 1910 was 7,665,111.

AGRICULTURE. The acreage, production, and value of the principal crops as estimated by the United States Department of Agriculture in 1914-15 were as follows:

		Acreage	Prod. Bu.	Value
Corn	1915	1,520,000	58,520,000	\$40,964,000
	1914	1,468,000	62,178,000	45,390,000
Wheat	1915	1,330,000	24,805,000	25,589,000
	1914	1,312,000	28,747,000	24,897,000
Oats	1915	1,140,000	43,320,000	19,061,000
	1914	1,078,000	32,190,000	16,417,000
Rye	1915	274,000	4,982,000	4,143,000
	1914	280,000	5,040,000	4,188,000
Barley	1915	8,000	286,000	177,000
	1914	7,000	196,000	137,000
Potatoes	1915	280,000	20,160,000	15,120,000
	1914	268,000	28,140,000	16,321,000
Hay	1915	3,100,000	4,840,000	67,704,000
	1914	3,141,000	4,020,000	58,290,000
Tobacco	1915	81,400	42,890,000	8,900,000
	1914	88,100	47,995,000	4,080,000

a Tons. b Pounds.

LIVE STOCK. The United States Department of Agriculture estimated that on Jan. 1, 1916, and Jan. 1, 1915, horses numbered 602,000 and 596,000, valued at \$74,648,000 and \$79,864,000; mules numbered 47,000 and 46,000, valued at \$6,439,000 and \$6,532,000; milch cows numbered 971,000 and 943,000, valued at \$54,862,000 and \$56,108,000; other cattle numbered 657,000 and 638,000, valued at \$17,805,000 and \$18,693,000; sheep numbered 856,000 and 831,000, valued at \$4,794,000 and \$4,404,000; swine numbered 1,210,000 and 1,186,000, valued at \$12,584,000 and \$16,011,000. The production of wool in 1915

and 1914 was 3,959,000 and 4,030,000 pounds, respectively.

MINERAL PRODUCTION. The total production of coal in the State in 1914 was 238,804,801 short tons, valued at \$347,187,695. The production of both anthracite and bituminous coal was less than in 1913, but owing to the fact that anthracite no longer enters to any extent into the manufacturing industries, it was not so seriously affected by the industrial depression of 1914 as was the bituminous output. The aggregate production of anthracite and bituminous in 1913 amounted to 265,306,139 short tons, valued at \$388,220,933. The output of anthracite in 1914, notwithstanding the decrease, was, with the exception of 1913, the largest ever obtained. The output of bituminous coal in 1914 was exceeded in the years 1907, 1910, 1912, and 1913. The total number of men employed in the coal mines in the State during the year was the largest on record. They numbered 363,880. There were during the year 595 fatal accidents in the anthracite mines in the State, and 402 in the bituminous mines. The coke produced in 1914 amounted to 20,258,393 short tons, valued at \$42,447,886.

The output of petroleum in 1914 amounted to 8,807,335 barrels, an increase of 352,033 barrels over the production of 1913. This notable increase, coming from a State whose oil production previous to 1913 had shown a fairly steady decline for 13 years, is worthy of mention, for it was accomplished without the discovery of new pools within the productive area. The market price was an average of \$1.90 per barrel, except for 1913, when the average price was \$2.14. This price exceeded that received for the State product in any single year since 1877. The value of oil amounted to \$15,573,822. This total exceeds the increase of any single year's output since 1908. The value of the total mineral production in 1914 was \$452,374,086, compared with \$506,341,809.

TRANSPORTATION. The total railway mileage within the State in 1914 was 13,603.

EDUCATION. The total number of pupils in the State on July 5, 1915, was 1,461,937. There were in daily attendance in the schools, 1,166,513. The total number of teachers was 41,283, of these 32,366 female, and 8917 male, teachers. The total expenditure for school purposes in 1915 was \$58,414,225. The Legislature of 1915 created a bureau of vocational education in the Department of Public Instruction.

FINANCE. The report of the State treasurer for the fiscal year ending Nov. 30, 1914, showed a balance on Dec. 1, 1913, of \$6,765,491. The total receipts were \$31,391,725, and the expenditures, \$31,578,111, leaving a balance in the treasury on Nov. 30, 1914, of \$7,427,208.

CHARITIES AND CORRECTIONS. The State charitable and correctional institutions include the State Institution for the Feeble-minded of Western Pennsylvania at Polk; State Hospital for the Criminal and Insane at Fairview; Homeopathic State Hospital for the Insane at Allentown; State Hospital for the Insane at Danville; Pennsylvania State Lunatic Asylum at Harrisburg; State Hospital for the Insane at Norristown; State Hospital for the Insane at Warren; State Asylum for the Chronic Insane at Wernerville; Home for the Training in Speech of Deaf Children at Philadelphia; Pennsylvania Oral School at Scranton; Eastern Penitentiary at Philadel-

phia; Western Penitentiary at Pittsburgh; Pennsylvania Industrial Reformatory at Huntingdon; Pennsylvania Reform School at Morgantown; and Pennsylvania Soldiers' and Sailors' Home at Erie.

POLITICS AND GOVERNMENT. Martin G. Brumbaugh was inaugurated Governor on January 19th. In his inaugural address he urged the passage of a local option law. The Legislature passed a resolution providing for the submission of a woman suffrage amendment in the November election. This resolution had already passed the Legislature of 1915. The Legislature passed in May a bill providing for a 51 hour week, and not more than 9 hours of labor in one day for children under 16. Where a school is provided by the educational authorities, 8 of the 51 hours must be spent in school unless the child is 16 years of age. The bill also prohibited night work by children; regulated street trades; and ruled against the employment of minors as messengers after 9 P.M. The bill attracted unusual attention because more children under 16 years are employed in Pennsylvania than in any other State. The glass factories and textile industries in which many children are employed are especially dangerous. These industries made a strong effort to have the bill amended. The Legislature also passed a workmen's compensation measure. The act was elective, but with a provision that the people should vote in November on a constitutional amendment permitting the Legislature to make it compulsory. The measure also created a State insurance fund. Domestic and agricultural laborers are exempt. In the election held on November 2nd the woman suffrage amendment was defeated by a vote of 356,000 for, to 400,000 against. See WOMAN SUFFRAGE.

STATE GOVERNMENT. Governor, Martin G. Brumbaugh, Republican; Lieutenant-Governor, Frank B. McClain, Republican; Secretary of the Commonwealth, Cyrus E. Wood, Republican; Treasurer, Robert K. Young, Progressive; Auditor-General, A. W. Powell, Progressive; Adjutant-General, Thomas J. Stewart, Republican; Attorney-General, Francis S. Brown, Republican; Superintendent of Public Instruction, N. C. Schaeffer, Democrat; Insurance Commissioner, Charles Johnson, Republican; Commissioner of Agriculture, Charles E. Patton, Republican.

JUDICIARY. Supreme Court: Chief Justice, J. Hay Brown; Associate Justices, William P. Potter, John Stewart, Robert von Moschzisker, S. L. Mestrezat, Robert S. Frazer, and one vacancy; Prothonotary, Middle District, William Pearson (Harrisburg); Prothonotary, Western District, George Pearson (Pittsburgh).

STATE LEGISLATURE:

	<i>Senate</i>	<i>House</i>	<i>Joint Ballot</i>
Republicans	88	164	202
Democrats	11	41	52
Republican majority..	27	123	150

PENNSYLVANIA, UNIVERSITY OF. The total enrollment in all departments of the university was 6332. The instructors numbered 560. The university was brought into prominence as a result of the dismissal from the faculty of Prof. Scott Nearing on January 17th, on the ground that he had made speeches of a radical nature, which made him no longer useful as

a member of the faculty. Much was published in defense and in criticism of this action. On September 28th, 1500 students of the university signed a petition asking the trustees to recall Dr. Nearing, but the board of trustees refused to reconsider their action. (See *UNIVERSITIES AND COLLEGES, Academic Freedom*.) The university received no noteworthy benefactions during the year. The library contained some 450,000 volumes. The president was Edgar F. Smith, Ph.D.

PENNSYLVANIA STATE COLLEGE. An institution for higher education founded at State College, Pennsylvania, in 1855. The total enrollment in the autumn of 1915 was 3326. The faculty numbered 285. During the year Dr. T. C. Blaisdell, president of Alma College, was appointed dean of the school of Liberal arts; Prof. R. L. Sackett, of Purdue University, became dean of the school of engineering. No noteworthy benefactions were received during the year. The productive funds of the college in 1915 amounted to \$567,000, and the income for the year ending June 30, 1915, was \$947,309. The library contained 54,275 volumes.

PENOLOGY. The attitude of society toward those of its members who violate its laws is rapidly undergoing a revolutionary transformation. The old theory that the law-breaker was wholly responsible for his acts, led to the adoption of revengeful and punitive measures in society's treatment of him. The theory of individual responsibility led logically to the theory of retribution, that is, that society must adopt measures of getting even with the law-breaker. The newer point of view emphasizes the responsibility of society for the existence of the criminally minded. This change of view is only one phase of the growing sense of social solidarity and of general responsibility for whatever consequences naturally follow from those conditions which society permits to exist, but is also due to biological and psychological studies of criminals themselves. Thus on the sociological side it is found that the criminal is largely a product of vicious social conditions; on the biological side it is found that the criminal suffers from defective heredity; while the psychiatrist finds that the criminal class is very largely feeble-minded or sub-normal in mental capacity. As a result expert opinion strongly demands that the criminal should be treated as an individual and his treatment adapted to his special condition.

Among the scientific investigations of criminals one of the most notable is that of Dr. Charles Goring of London, who completed an investigation of some 3000 convicts in English prisons. His conclusions were: the hereditary nature of criminality is clearly established; the influence of the social environment is extremely small; and mental deficiency is probably the chief cause of delinquency. Similar results were obtained by the extensive work of Dr. Henry H. Goddard of the Vineland Training School. An opposing view, however, is taken by those who lay special stress upon environmental factors of prison reform. The new attitude is producing marked changes in prison methods. The dark cell and physical punishment are being abolished in favor of rewards for good behavior and a deprivation of privileges for breaches of discipline. Likewise head shaving, prison stripes, the lock step, and various other personal humiliations are disappearing. More and more convicts are sen-

tenced for indefinite periods; and prison officials are paroling convicts who have shown themselves worthy of restoration to normal social relations. There has also been a tremendous change in the methods of convict labor, as noted in the paragraph on *Legislation* below. During the year North Carolina made marked improvement in the conditions of its convict camps; Arizona introduced an honor system with construction work in the open air, with plenty of good food and wholesome surroundings. Numerous States have introduced the custom of paying prisoners a small wage which is either accumulated for them until their discharge or sent to their dependents. Along with this wide-spread reform of prison methods has developed opposition to capital punishment. Laws abolishing capital punishment were passed in 1915 in North and South Dakota, while similar bills were introduced in New York, New Jersey, Illinois, New Hampshire, and Arkansas. An anti-capital punishment society was organized in New York. See also *MILITARY PROGRESS* for military penology.

OSBORNE AND SING SING. Among the most notable prison reform movements was that led by Thomas M. Osborne, warden of Sing Sing Prison. In his view, punishment does not reform, while the aim of the prison should be to make every man capable of living an honest and useful life. Since criminality is fundamentally a disease the prisoner should be kept in prison until sufficiently cured. He advocates methods of training which will encourage honesty and uprightness, and develop in the criminal a healthy mind and body and a sense of responsibility. He consequently extended the honor system so as to include the idea of self-government. A foundation for all good prison work was laid by developing a spirit of coöperation among the prisoners. The abolition of brutal treatment resulted in an atmosphere of confidence in place of one of suspicion. This was followed by allowing the prisoners to regulate conditions to a certain extent through their own Mutual Welfare League. To the League all privileges were given, and the League as an organization became responsible for the good conduct of its members. Each violation became an offense against the League, punishable by its duly constituted officers through judicial procedure. Thus the loyalty of a man to his friends, to the "gang," was brought to the aid of prison authorities. Mr. Osborne's fundamental principles are: (1) The law must decree not punishment, but temporary exile until the offender has proved by his conduct that he is fit to return. (2) Society must brand no man as a criminal, but aim solely to reform the mental conditions of the individual who committed the criminal act. (3) The prison must be an institution where every inmate shall have the largest practicable amount of individual freedom because "it is liberty alone that fits men for liberty."

Among the results claimed for Osborne's methods were: improved mental and physical condition of the prison population; a reduction in the number of escapes; a reversal of the attitude of prisoners toward escapes; an increase in the productivity of prison labor; a reduction of 30 per cent in insanity; a reduction in the use of drugs. There had been formed a knitting class with 300; a shorthand class with 50; a class in industrial drawing with 30. Moreover, various groups engaged in the study of music, tele-

graphy, clay modeling, and foreign languages. Athletic contests created a wholesome mental attitude.

Almost from the first there had been decided opposition to some of Warden Osborne's methods. This was shown in various controversies with Superintendent of Prisons John B. Riley. In November the Westchester County Grand Jury began an investigation of the situation at Sing Sing. Late in December Mr. Osborne was indicted upon two counts for perjury, and for mismanagement on six different counts. In the indictment for mismanagement he was accused of absenting himself from the prison on an average of three days a week since Dec. 1, 1914; of failure to report felonies committed in the prison; of permitting various persons to visit Charles Becker while he was awaiting his end in the Death House; of allowing "certain unworthy and unfit inmates of Sing Sing Prison to control the direction and management of the discipline and police of said prison," causing confusion and making discipline difficult; of permitting 38 assaults by inmates upon their fellows; and he was accused of immorality. The indictment for perjury was due to testimony alleged to have been given by Osborne to Dr. Diedling of the Prison Commission that there were no more serious cases in the prison wherein morals were affected, a statement said to be untrue. Mr. Osborne said the indictment was the result of "corrupt political conspiracy" and the action of disgruntled inmates of the prison. He said, "Because I have run Sing Sing Prison with business honesty and efficiency I have made myself hated by the corrupt political elements that have long utilized the prison for their own foul purposes." On December 31st Mr. Osborne signed a request for leave of absence, and Prof. George W. Kirchwey, a personal friend of Osborne's, was placed in charge of the prison.

THE AMERICAN PRISON ASSOCIATION met in California in October. The most striking feature of the programme was the attention given to the relation of mental defectiveness to problems of crime and penology. The necessity for careful psychological studies was urged. There was an absence of the extreme emphasis hitherto laid upon heredity; instead, there were considered both hereditary and environmental factors which may contribute to criminalistic tendencies and habits. The honor system was advocated, doubt arising about its efficacy in regard to the mental defective and habitual criminal. Papers were also read on the parole system, and the problems of managing industrial schools for boys.

LEGISLATION. *In Various States.* Much attention has been given in recent years by State Legislatures to the establishment of better conditions for convict labor. During 1915 18 States enacted laws with reference to employment of such labor on highways; the only States not permitting such labor are Maryland, New Hampshire, and Rhode Island. Several States provided for the preparation of road materials at prison camps and on State farms. Oklahoma authorized the establishment of a steel plant for the production of bridge and building shapes. Montana provided for a referendum on the question of the construction of a binding twine factory; while Oregon provided for the erection of a flax mill, and Missouri established a binding twine plant at the penitentiary. Numerous pro-

visions for wage allowances to convicts were made, some States granting pay for over-time and others allowing extra pay or extra good time for convicts employed outside the prison. Such pay may go to the support of dependents or be retained for the use of the convict when free. Various States, especially in the West and Middle West, prescribed the State account, State use, or public works and ways systems with the special requirement that competition with free labor be avoided and that special effort be made to teach useful trades and callings, and develop the intellectual and moral capacity of prisoners.

The Pennsylvania law was especially comprehensive. It established a prison-labor commission with authority to install machinery for carrying on various industries. The manufacture and production of supplies for State and county institutions was provided for; also the manufacture of building material for the construction or repair of State institutions. The law contemplated also the preparation of crushed stone, brick, tile, culvert pipe, and other material suitable for road-building and drainage. Convicts are to be credited with wages at the rate of from 10 cents to 50 cents per day, wages to depend not merely on the character of the work, but upon the willingness, industry, and conduct of the prisoner. Three quarters of such wages are to be sent to dependents, or all of it at the prisoner's request. In the absence of dependents earnings accumulate to the credit of the prisoner and are to be paid to him in installments, one-third on discharge, one-third in three months, and the remainder in six months. Convicts employed on the public highways will receive 25 cents per day.

Chicago. A new Crime Commission was appointed in Chicago as a result of the report of the City Council Committee on Crime of which Prof. Charles E. Merriam was chairman. Two aspects of the problem were brought out. (1) Professional criminals escape the penalties of the law and prey upon society at will. (2) Jails and prisons of Chicago are filled with petty criminals and victims of poverty, oftentimes people not guilty of crime at all. It was shown that out of 109,764 persons arrested in a single year, less than 10 per cent are arrested on felony charges, 40 per cent are fined, 2 per cent are held for the grand jury, 1 per cent are sentenced to the county jail, and 1.8 per cent are sentenced to the House of Correction, leaving a large percentage of people who have been subjected to hardship by needless arrests. It was shown that these injustices fall largely upon the poor, and that the well-to-do are not arrested for trivial offenses. In an investigation of 14,709 prisoners in the House of Correction, 12,124, or 82 per cent, were there because they were unable to pay their fines.

Missouri. A special committee of the State Senate made its report to the General Assembly on Penitentiary Reform. The purpose of the committee was to report the advisability of abolishing the contract labor system. Among its recommendations were the following: the abolition of the private contract system; the indeterminate sentence except for murder, treason, rape, arson, and robbery; creation of a separate reformatory for juvenile offenders; segregation of diseased prisoners; provision of opportunity for prisoners to earn money; the education of all prisoners; a non-partisan and non-sectarian ad-

ministrative board; the purchase of four farms of 640 or 1280 acres each and the use of prisoners thereon and in brick-making and road-building; the substitution of the electric chair for the scaffold; and the promotion of factory enterprises at the penal institutions.

In Congress. For a number of years the National Committee on Prisons and Prison Labor has advocated the enactment of what is known as the Booher-Hughes Bill for the control of Federal prisons. The law is primarily due to the effort to control the shipment of convict-made goods in interstate commerce. Such shipment can be prevented only by Congress, so that while any State may prevent competition between its own convict labor and its free labor, it cannot prevent the competition of goods made by convicts in other States. This bill has passed the House four times and was reported favorably by the Senate Committee in 1915. It provides for a Commissioner of Prisons to be appointed by the President and Senate, and to have charge of the administration, housing, and social hygiene of prisoners, the educational methods for their rehabilitation, and systems of pardon and parole. It was pointed out that in addition to the 2000 prisoners in the Federal penitentiaries at Atlanta, Leavenworth, and McNeil's Island, there were more than 1000 other Federal prisoners in the Federal jails at Fort Smith, Guthrie, and in Alaska, and in State, county, and city prisons of the country.

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PENSIONS. See OLD AGE PENSIONS.

PENSIONS FOR MOTHERS. In 1912 a movement was begun for the establishment of pensions for widows or mothers with minor children. The prime purpose of this movement was to make it possible for needy mothers to retain control of their own children. Pensions were thus advocated as an alternative to outdoor relief by either public or private charity, or to the segregation of the children in public or private children's homes and asylums. The immediate urgency of such legislation was greatly increased by the advance of child labor restrictions, preventing the employment of children of 12 to 16 years, who previously had been able to contribute something to the budgets of families of the poor. Moreover, it was argued and generally agreed that the peculiar interest of the mother guarantees better care for children than can be secured by any other arrangement. Five States enacted mothers' pension laws in 1912, and 12 additional States and 2 cities in 1913. No new laws were enacted in 1914; but in 1915 3 new States were added to the list, 2 others amended their laws, and 1 authorized inquiry. States having mothers' pension laws at the close of 1915 were: California, Colorado, Idaho, Illinois, Iowa, Massachusetts, Michigan, Minnesota, Missouri, Nebraska, New Jersey, New York, North Dakota, Ohio, Oregon, Pennsylvania, South Dakota, Utah, Washington, and Wyoming.

In 1915 legislation on the subject was enacted

in Florida, Nebraska, New York, North Dakota, Washington, and Wyoming. Florida authorized a commission of inquiry. Nebraska revised her act along administrative lines. New York provided pensions for needy widows with children under 16 years of age to the amount of about \$11 per month for each child. In North Dakota the law made provision for children up to the age of 14 years, the monthly allowance not to exceed \$15 per month for each child. The Washington statute threw restrictions about the administration of the law, while in Wyoming dependent widows were given assistance to the amount of \$20 for one child under 14, and \$10 additional for each additional child under that age.

Much of the legislation on this subject has aroused active criticism because of its hasty and ill-considered nature. A general survey of the considerable body of laws shows that the movement has spread with remarkable rapidity and has resulted in a great variety of legislative enactments. In this respect it probably is not, however, essentially different from the legislation on any new subject considered by the 50 legislative bodies of the country. In its original form the proposal was to give pensions to widows with minor children, and in this form it was actually begun by the Justice in the Juvenile Court in Kansas City in 1911. But the classes of beneficiaries were gradually increased so as to include in some States mothers of minor children with husbands in prison or in insane hospitals; or mothers of minor children whose husbands had deserted them; or even any women with minor children in need of aid. Indeed the idea has been stretched so as to include any family needing aid regardless of whether the father or guardian is at hand. Similar variation is shown in the amounts granted. Thus the pensions per month for the first child range from \$6.25 to \$15; and for each additional child, from \$5 to \$15. While the age limit of the children for whom pensions may be allowed is usually 14 years, in some States it is 15, 16, or even 18.

While, therefore, the great sweep of the movement has shown that the proposal has met with popular approval in this country, nevertheless there is considerable apprehension lest more harm than good may be done. In behalf of the proposal it is argued that mothers can care best for their own children; that the future welfare of the children requires that they be reared under normal conditions; and that other forms of aid are spasmodic and unreliable. Against the proposal it is argued that pensions from the public treasury will lessen parental responsibility; will lessen family ties; will reduce self-respect; and will result in racial deterioration by encouraging the multiplication of the less able stocks.

PERAK. A state (the most northerly) of the Federated Malay States (q.v.). Tin was discovered in Larut about 1850, and the mines have become the chief source of wealth in the country. The principal mining districts are Larut, Kinta, Batang, Padang, and Klian Intan. In 1913 the export of tin and tin ore was 43,967 piculs, valued at 49,744,768 Straits Settlements dollars. Rubber is an important product. Rice and coconuts are extensively grown.

The state is traversed by the main line of railway from Penang. Taiping is the government headquarters, Ipoh the commercial centre. The chief port is Teluk Anson. The Sultan, Sir Idris

Mersid-el Aâzam Shah, is the native ruler, aided by a British resident adviser, who in 1915 was Mr. R. G. Watson.

PERIM. A dependency of Aden (q.v.).

PERISCOPES. See **MILITARY PROGRESS, European War.**

PERRY, ENOCH WOOD. American artist and public official, died Dec. 15, 1915. He was born in Boston, in 1831, and in 1852 went to Europe, where he studied in Paris until 1856, when he was appointed consul at Venice. In this position he served for two years and then returned to the United States, where he devoted himself to art. He painted portraits of many important persons before the war. He also painted a portrait of General Grant. During his trip through the West he painted a portrait of Brigham Young, and other Mormon leaders. In 1866 he settled in New York, and was afterwards elected to the National Academy. Among other well known paintings are the "Contraband of Peace," "The Lost Art," "The Clock Doctor," "Saturday Afternoon," "The Sower," and the "Helping Hand." Mr. Perry established the free art school in Cooper Union, and was active in having land in Central Park set aside for a museum.

PERSIA. A constitutional Asiatic monarchy extending from the Caspian Sea to the Gulf of Oman. Capital, Teheran.

AREA AND POPULATION. The area is estimated at 1,645,000 square kilometers (635,135 square miles). The number of inhabitants is unknown, but a commonly accepted figure is 9,000,000, of whom about 2,500,000 are nomads. Population of Teheran, about 280,000; Tabriz, 200,000; Meshed, 130,000; Ispahan, 70,000; Kerman, 60,000; Yezd, 45,000; Resht, 42,000. The great majority of the people are Mohammedans of the Shiah sect. Persia is for the most part an infertile plateau, mountain-bound on three sides. A salt desert occupies the central and eastern portions. The Karun is the only navigable river. To the north and west are heavy forests.

The population is given over to misery and poverty by an incompetent and extravagant government; and foreign greed has greatly added to the burdens of the oppressed.

PRODUCTION AND COMMERCE. The agricultural products include cereals, cotton, sugar, opium, and tobacco. The country possesses valuable mineral resources—petroleum, coal, iron, copper, and lead; but exploitation on a considerable commercial scale is hindered by lack of transportation facilities. Silk and carpets are manufactured. The chief products for export, together with the imports for consumption, are shown in the table below, with values in the 1912-13 trade in thousands of krâns:

Imports	1000 Kr.	Exports	1000 Kr.
Cottons	186,910	Fruits	47,457
Sugar	138,579	Carpets	60,392
Tea	40,978	Cotton	93,843
Gold and silver bars and coins	17,108	Fish	8,245
Petroleum	10,841	Rice	42,809
Cotton yarn	18,580	Gold & silver coins	27,428
Flour	22,475	Gums	13,903
Woolens	15,815	Opium	34,916
Indigo, etc.	2,295	Wool	11,300
Haberdashery	10,100	Cocoons	11,786
Rice	5,802	Skins	12,675
Spices	3,594	Animals	8,885
Wool	3,253	Silk stuffs	6,639
Animals	1,466	Cottons	2,160
Matches	3,166	Hides	11,859
Silks	6,427	Silk	1,792
Tin, zinc, and lead	1,726	Wheat and barley	8,319
		Pearls	8,540

Imports	1000 Kr.	Exports	1000 Kr.
Tobacco	8,098	Woolens	2,365
Copper and nickel	2,506	Drugs	8,688
Iron and steel	4,749	Timber	1,095
Mfrd. iron & steel	5,918	Tobacco	2,437
Timber	3,447	Dyes	1,820
Silkworm eggs	2,607	Eggs	1,299

In 1910-11 the import of cottons was valued at 139,076,000 krâns; sugar, 120,596,000; silver, 42,467,000; tea, 24,822,000; cotton yarn, 11,145,000; woolens, 9,725,000; iron manufactures, 7,061,000; petroleum, 6,998,000. For the same year the export of raw cotton was valued at 70,380,000 krâns; fruits, 62,507,000; carpets, 46,693,000; rice, 29,210,000; hides and skins, 21,349,000; silk and cocoons, 17,601,000; opium, 13,170,000; gums, 11,950,000; wool, 10,483,000.

The trade by countries in 1912-13 is shown below, in thousands of krâns:

	Imps.	Exps.
Russia	328,980	300,878
U. K.	86,382	34,328
Brit. Ind.	66,799	22,270
Turkey	23,389	37,927
Germany	21,388	2,928
France	11,031	4,829
Aus.-Hung	8,042	567
Belgium	7,929	408
Afg'istan	4,360	2,448
Italy	2,738	8,004
Oman	1,047	7,878
China	789	3,474
U. S.	947	6,375
Other	2,481	2,376
1912-13	567,576	436,838
1910-11	484,508	375,427
1909-10	442,428	871,526
1908-09	372,484	826,207

Vessels entered at Persian Gulf ports in the 1910-11 trade, 4492, of 1,443,838 tons (1096 of 1,151,822 tons, British); at Caspian ports (all Russian), 2755, of 718,765 tons. In the 1912-13 trade, the tonnage entered at Persian Gulf ports was 1,927,207 (1,549,921 British); at Caspian ports, 752,617.

Trade is carried on over the great caravan routes. These are infested with brigands, with whom the Persian government is powerless to deal adequately, and the danger and uncertainty incident to transportation have been the subject of much dissatisfaction on the part of British traders in the south and Russian traders in the north.

FINANCE AND GOVERNMENT. The customs office, as well as the post office, has been managed since 1900 by Europeans, native officials being represented as dishonest and oppressive. The revenue (about half of which is derived from taxes levied in kind or in cash upon the laboring classes) fluctuates between 70,000,000 and 100,000,000 krâns; no statement of expenditure can be made, except that it regularly exceeds the revenue. The Russian debt of 1900 amounts to 22,500,000 rubles at 5 per cent, payable in 75 years and guaranteed upon the customs receipts other than those of the Province of Fars and of the Persian Gulf ports; debt of 1902, 10,000,000 rubles at 5 per cent; debt of 1913, 2,000,000 rubles at 7 per cent. British loans of 1910 and 1911, £2,675,181 at 5 per cent; loans of 1912, 1913, and 1914, £490,000 at 7 per cent. Floating debt, 104,870,000 krâns; annuities, 14,000,000 krâns. The exchange value of the krân is about 8.75 cents.

Persia is a constitutional monarchy, hereditary in the Shiah dynasty of the Kajars since 1794. The country is divided into 33 provinces administered by Governors-General appointed by the Shah, but the nomad tribes are ruled by their own chiefs, so far recognized by the central government as to be held responsible for the collection of revenue. Persia became a party in 1912 to the Anglo-Russian Convention of Aug. 31, 1907, by which each of the two contending powers agreed to confine its political and commercial operations to definite regions not overlapping; Persia agreed to respect these rights and to reorganize her army to suit the two powers. The Mejliss (a national assembly provided for in the constitution of June, 1909) was dissolved in December, 1911, and no elections were afterwards held until the summer of 1914. Ruling sovereign, Ahmed Shah Kajar (born 1898), son and successor of Mohammed Ali Shah, who abdicated July 16, 1909. There was a regency until the coronation of Ahmed Shah, July 21, 1914.

HISTORY. Although officially Persia remained neutral in the war, Persian territory, particularly in the extreme northwest, was regarded both by the Russians and by the Turks as a legitimate theatre of war. The military operations on Persian soil are described in the article on the WAR OF THE NATIONS (q.v.); in this place, however, it should be noted that not only was the Persian Province of Azerbaijan devastated by successive Russian and Turkish invasions, but furthermore the Kurdish tribesmen in Northwestern Persia, taking advantage of the Persian government's inability either to resist invasion or to maintain order, and possibly encouraged by their Mohammedan co-religionists in Turkey, instituted a systematic massacre of the Armenian and Nestorian Christians in the Province of Azerbaijan. The condition of the region about Lake Urumiah became so appalling that in March the American and British consuls at Tabriz appealed to the Russian forces to intervene and protect American missionaries. (For the corresponding massacres in Asiatic Turkey, consult *TURKEY, History, Armenian Atrocities.*) By the end of April between 30 and 40 thousand Armenian and other Christians had fled from Azerbaijan; many hundreds had been massacred; and thousands had died as a result of unsanitary conditions. Throughout the year a strong influence was exerted in Persia by German and Turkish propagandists. The German diplomatic representative, Prince Henry of Reuss, labored indefatigably to combat the influence of Great Britain and Russia. Mohammedan tribesmen were incited to revolt. The Persian *gendarmerie* proved disloyal. Kum and Hamadan became centres of militant pro-Germanism. The Shah was only with difficulty dissuaded from abandoning his capital. On November 16th, however, the Entente ministers succeeded in inducing young Ahmed Shah to remain in Teheran, where, as a glance at the map will demonstrate, he would be under Russian influence, and in December, after the Russian armies had reestablished their military predominance in Northern and Northwestern Persia, he was persuaded to dismiss his pro-German premier, Mohammed Ala Khan, and to appoint a pro-Allied cabinet, with Prince Firman Firma as premier.

Consult also article WAR OF THE NATIONS, *passim*.

PERU. A South American republic, between Ecuador and Chile. Capital, Lima.

AREA, POPULATION, ETC. Unsettled boundaries involving many thousands of square miles render impossible a definite statement of Peru's area. If certain lines be taken as the probable final boundaries, an estimate of 1,769,804 square kilometers (683,335 square miles) is reached. Another estimate is 1,833,916 square kilometers (708,075 square miles). A population estimate of 1913 was 5,800,000, but there is reason to believe that this figure is much too high. Probably more than one-half of the people are Indians; most of the remainder are mestizos. The estimated population of Lima is about 150,000; Arequipa, 35,000; Callao, 34,500; Cuzco, 30,000; Ayacucho and Iquitos, 20,000 each.

Illiteracy is general. Elementary instruction is nominally but not actually compulsory. In 1913 the reported number of public schools was 2253, with about 150,000 pupils. There are 27 national colleges, a few other secondary schools and private schools of various grades, and several institutions for special instruction. There are four universities, at Lima, Cuzco, Arequipa, and Trujillo.

PRODUCTION AND COMMERCE. The leading crops are sugar cane and cotton. Large quantities of rubber are gathered in the northeast. Other products of some importance are coffee, rice, corn, wheat, cacao, and tobacco. In 1913 the mineral output of Peru was valued at £4,494,806. Coal amounted to £1,999,250. The silver output was 299,132 kilos, valued at £1,131,150. The copper output increased from 26,970 metric tons in 1912 to 27,776 tons in 1913. The petroleum output was 233,600 tons in 1912 and 276,147 in 1913.

Imports and exports have been valued as follows, in libras (libra = pound sterling, or \$4.86656):

	1910	1911	1912	1913	1914
Imports:					
	4,980,697	5,438,247	5,157,686	6,088,777	4,827,930
Exports:					
	7,074,076	7,416,028	9,488,581	9,137,780	8,767,790

Some of the principal classified imports in 1913 were as follows: metals and manufactures thereof, £725,633; cotton textiles and manufactures, £688,360; tools, ships' stores, machinery, and vehicles, £923,203; wood and manufactures, £377,236; coal, earth, stone, earthenware, glassware, etc., £510,046; comestibles and condiments, £752,886; wool and manufactures, £302,233; medicines and pharmaceutical products, £212,046.

Leading exports in 1913: cotton, £1,424,229; sugar, £1,380,261; rubber, £815,814; alpaca, £323,370; hides, £191,231; sheep wool, £163,933; llama wool, £161,291; copper and silver bars, £1,536,157; benzine, £542,242; lead and silver ore, £337,850; petroleum, £331,862; copper and silver ore, £325,410; gold ore, £156,776; guano, £150,120; silver sulphide, £70,074.

Imports and exports by principal countries in thousands of libras:

	Imports		Exports	
	1912	1913	1912	1913
United Kingdom	1,199	1,599	2,517	3,408
United States	1,106	1,755	2,088	3,083
Germany	821	1,056	508	610
France	269	280	772	822

	Imports		Exports	
	1912	1913	1912	1913
Italy	254	254	1	2
Belgium	245	884	106	249
Chile	196	288	895	1,244

COMMUNICATIONS. As in other South American countries, transportation facilities are very inadequate, but efforts are being made toward road construction and improvement. The length of railway in operation in 1912 was 2766 kilometers (1719 miles). Telegraphs in 1914: 317 offices, with 15,000 kilometers of line and 126,350 kilometers of wire. There is a system of wireless telegraphy. Post offices in 1914, 781; receipts £686,814, expenses £659,604.

The Central Railway of Peru is said to cross the Andes Mountains at the highest point reached by any standard gauge railroad in the world, one short branch reaching an altitude of 15,586 feet, which is higher than Mount Blanc, the highest peak of the Alps.

FINANCE. Gold is the standard of value in Peru. The monetary unit is the libra, equivalent to the pound sterling (\$4.86656). Revenue and expenditure in 1912, £3,425,543 and £3,493,629; in 1913, £3,417,974 and £3,313,396. The budget for 1915 placed the estimated revenue at £2,847,275 and the estimated expenditure at £2,973,471. Customs form the largest item of revenue. The larger estimated disbursements for 1915 are, by departments: finance, £997,172; agriculture, £480,761; interior, £476,733; war and marine, £724,191. The foreign debt is stated at £5,392,458; internal debt, £2,660,645, besides £471,355 without interest.

GOVERNMENT. Under the constitution the executive authority is vested in a President who is elected by direct vote for four years and is ineligible for the succeeding term. He is assisted by a cabinet of six ministers. There is a Congress of two chambers, the Senate and the House of Representatives. Senators (52 in number) and representatives (116) are elected by direct vote for six years.

On Aug. 10, 1915, the Congress elected José Pardo President to succeed the provisional President, Col. O. R. Benavides. Pardo was inaugurated on Aug. 18 for the four year term. First Vice-President, Ricardo Bentín; second Vice-President, M. Melitón.

HISTORY

BILLINGHURST EXILED. Ex-President Guillermo Billinghurst, who was exiled from Peru, after having been deposed by Col. Oscar Benavides, was ordered on January 8th to leave Chile, where he had endeavored to find refuge, within eight days. At the same time Dr. Augusto Durand, the Peruvian Liberal leader, was ordered to leave Chilean soil. The former President, however, did not leave Chile. He was taken ill, and on January 28th he died at Iquique. On the same day Fernando Gazzani, who had resigned from the ministry of foreign affairs on the previous day, was shot and dangerously wounded in a duel with Juan Durand, brother of the Liberal leader. The dispute arose out of the action of Gazzani in suggesting to the Chilean government that the two deposed leaders be asked to leave the country. On the 19th of January the Peruvian Senate in secret session decided to reduce the size of the army and suspend the amortization of public debts during the Eu-

ropean war. A week later the Chamber of Deputies authorized the loan of 3,500,000 *soles* (\$1,680,000). The President immediately issued a call to Congress to convene to approve this loan as well as the budget. The financial discussion brought about a crisis on February 14, with the result that the cabinet resigned in a body. The new cabinet appointed by the President on February 20th consisted of Señor Solon Polo, minister of foreign affairs; Colonel Abrill, minister of marine and war; Señor Victor Benavides, minister of government; Señor Placido Jiménez, minister of justice; Señor Enrique Oyanguen, minister of finance; Señor Francisco Alayza Noel, minister of public works. The arbitration treaty with the United States, drawn up on July 14, 1914, was signed at Lima on March 5th by Señor Solon Polo, Peruvian minister of foreign affairs, and Benton McMillin, American minister to Peru.

PRESIDENCY OF JOSÉ PARDO. On May 18th Señor Don José Pardo was reelected President of Peru by a large majority. The elections were the quietest ever held in the republic. Señor Pardo had been President in 1904 and had then been made minister to France, a position which he held until 1914. Col. Oscar Benavides, provisional President of the republic, resigned his office on August 18th and Pardo became President. His new cabinet consisted of Señores Enrique de la Riva Agüero, minister of foreign affairs; Dr. Luis Julio Menéndez, minister of interior; Aurelio García Lastres, minister of finance; Wenceslao Valera, minister of justice; Col. Benjamin Puente, minister of war; Dr. Belisario Sosa, minister of public works.

LEGISLATION. In October the House of Representatives, after an acrimonious debate, approved a constitutional amendment granting religious freedom to all denominations. As the result of petitions against the amendment, and in deference to the overwhelming sentiment of his cabinet, President Pardo withheld his signature from the amendment, and returned the bill to Congress for reconsideration. On November 12th, consequently, the two houses of Congress met in joint session, and formally promulgated the religious liberty amendment. Crowds in the streets vehemently protested against the action of the Legislature, and Father Díaz, a deputy who during the joint session had dramatically exhibited his opposition to the amendment by seizing and tearing the document to shreds, was hailed as the champion of religion. In November the Congress also passed a Mineral Export Tax Bill, levying an export duty of 25 cents per ton on petroleum, and \$3.75 per ton on copper, with a provision that in case the price of copper in London should exceed \$325 per ton, the tax should be increased at the rate of 50 cents on \$5.

INTERNATIONAL RELATIONS. An arbitration treaty with the United States, drawn up on July 14, 1914, was signed at Lima, March 5, 1915, by Señor Solon Polo, Peruvian minister of foreign affairs, and Mr. Benton McMillin, American minister to Peru. On July 9th Peru and Ecuador strengthened their relations by establishing an international parcel post between the two countries. Exchange stations were organized in Lima and Guayaquil. This was one of the first of many efforts made to bring about a closer spirit of relationship between the Pan-American republics.

PETIT MAL. See EPILEPSY.

PETROLEUM. The production of petroleum in the United States in 1914 was 290,312,535 barrels. Of this quantity 265,762,535 barrels were either marketed or were utilized directly in field development, and 24,550,000 barrels were placed in storage to meet further requirements. The marketed production in 1914 considerably exceeded that in 1913, when it reached a total of 248,446,230 barrels. The total value of the output in 1914, however, was considerably less than in 1913, and in respective figures were \$214,125,215 and \$237,121,388. The average price per barrel in 1914 was \$.806, as compared with \$.954 in 1913. No important changes were made in the rank of oil producing States in 1914, although the annual output of the Cushing Pool in Oklahoma made that State a strong competitor for first place, which was, however, retained by California, by a margin of about 10,000,000 barrels. Wyoming showed the greatest relative increase in 1914, exceeding its output in 1913 by nearly 48 per cent. It failed, however, to gain a rank above nine. The greatest relative decline took place in West Virginia, which recorded a decrease of 16 per cent below the output of 1913. See also **CHEMISTRY, INDUSTRIAL;** and **GEOLOGY.**

The following table shows the output and its value in the several States in 1913-14:

TOTAL QUANTITY AND VALUE OF MARKETED PRODUCTION OF PETROLEUM IN THE UNITED STATES AND THE AVERAGE PRICE PER BARREL IN 1913 AND 1914, BY STATES, IN BARRELS

1913				1914			
State	Quantity	Value	Average price per barrel	State	Quantity	Value	Average price per barrel
Alaska	(a)	(a)	....	Alaska	(a)	(a)	....
California	97,788,525	\$45,709,400	\$0.467	California	99,775,327	\$48,066,096	\$0.482
Colorado	188,799	174,779	.926	Colorado	222,773	200,894	.902
Illinois	28,893,899	30,971,910	1.296	Illinois	21,919,749	25,426,179	1.160
Indiana	956,095	1,279,226	1.387	Indiana	1,335,456	1,548,042	1.159
Kansas	2,875,029	2,248,288	.947	Kansas	3,103,585	2,433,074	.784
Kentucky	524,568	675,748	1.288	Kentucky	502,441	498,556	.992
Louisiana	12,498,828	12,255,981	.981	Louisiana	14,309,485	12,886,897	.901
Michigan	(a)	(a)	....	Michigan	(a)	(a)	....
Missouri	(a)	(a)	....	Missouri	(a)	(a)	....
New Mexico	(a)	(a)	....	New Mexico	(a)	(a)	....
New York	948,191	2,284,307	2.409	New York	988,974	1,760,868	1.875
Ohio	8,781,468	17,538,452	1.997	Ohio	8,536,352	18,372,729	1.567
Oklahoma	63,579,884	59,581,948	.937	Oklahoma	73,631,724	57,258,187	.778
Pennsylvania	7,917,302	19,690,503	2.487	Pennsylvania	8,170,385	15,578,822	1.906
Texas	15,009,478	14,675,593	.978	Texas	20,068,184	14,942,848	.745
West Virginia	11,567,299	28,828,814	2.492	West Virginia	9,680,033	18,468,540	1.908
Wyoming	2,406,522	1,187,232	.493	Wyoming	3,560,375	1,679,192	.472
Other States	b 10,843	b 19,268	1.777	Other States	c 7,792	c 14,291	1.834
Total	248,446,230	237,121,388	.954	Total	265,762,535	214,125,215	.806

a Included in other States. b Includes Alaska, Michigan, Missouri, and New Mexico. c Includes Alaska, Michigan, and Missouri.

PHARMACY, SCHOOLS OF. See **UNIVERSITIES AND COLLEGES.**

PHELPS, THOMAS STOWELL. American rear admiral, retired, died Nov. 3, 1915. He was born in Portsmouth, Va., in 1848, and graduated from the United States Naval Academy in 1869. He was promoted through the various grades and became rear admiral in 1899. He served in all the naval stations, and on various vessels, and took part in the Spanish-American War. From 1907-10 he was commandant at the Mare Island Navy Yard. He retired from active service in 1910.

PHILIPPINE ISLANDS. POPULATION. The last census of the Philippines was taken in 1903. The population on that date was 8,265,348.

AGRICULTURE. The Bureau of Agriculture has directed its efforts for several years toward the improvement of agricultural conditions in the Is-

lands. Agriculture is taught in the schools under the direction of the Board of Education. The agricultural conditions for the fiscal year ending June 30, 1914, were notable chiefly for increases in the exports of agricultural productions, particularly sugar and hemp, although the European war seriously affected the latter industry, and the exports of fibre fell off heavily during the latter part of the year. The quantity of copra shipped increased considerably over the previous year, but owing to much lower prices in value was one and one-half million dollars less than in 1913. The sugar cane exported to the United States for the year ending June 30, 1915, amounted to 326,842,296 pounds, valued at \$7,511,126. This was a remarkable increase over the exports of 1914, which were 116,749,211 pounds, valued at \$2,553,601. The manila hemp exported to the United States in 1915 was valued at \$9,161,729, compared with \$9,713,695 in 1914. The government has made liberal appropriations for the Bureau of Agriculture for irrigation projects, and for money to be loaned by the agricultural bank, and for yearly loans amounting to 2,000,000 pesos annually to the sugar producing farmers in certain provinces.

COMMERCE. The total value of the commerce during the fiscal year 1914 was about \$4,000,000 below that of the previous year. The decline,

due chiefly to the European war, was in the import trade. The value of the exports increased approximately \$1,000,000. The United States purchased nearly one-half of the exports from the Islands, and to America were sent about one-half of the imports. For the fiscal year ending June 30, 1915, the shipments from the United States to the Philippines amounted to \$24,755,320, compared with \$27,304,587 in 1914. Shipments to the United States from the Philippine Islands in 1915 amounted to \$24,020,169, compared with \$18,162,312 in 1914. Manila hemp is the most important export in point of value. There were exported of this, 50,587 tons, valued at \$9,161,729. Sugar cane ranks next in importance. The fruits and nuts, and copra exported in 1915 amounted to \$2,145,743, compared with \$1,479,468 in 1914.

MINERAL PRODUCTION. There were produced

in the gold mines of the Islands, in 1914, gold valued at \$1,174,633, compared with the value of \$868,362 in 1913. About \$610,000 was produced by the quartz mines of the Aroroy district on the Island of Masbate. Placer mines in the Camarines Province of Southeastern Luzon produced about \$515,000. The production of silver in 1914 was 10,300 ounces. This was recovered from gold bullion refined.

FINANCE. The total receipts for the fiscal year ending Dec. 31, 1914, including transfers from sinking funds, and supplies brought into account, amounted to \$16,789,654. This includes a balance at the beginning of the year of \$4,982,994. The total expenditures for the year amounted to \$12,530,626, leaving a surplus of cash of \$308,491, of supplies, \$2,603,346, and surplus in other forms of \$1,347,290. The bonded indebtedness of the government, including the indebtedness of the cities of Manila and Cebu, amounted to \$16,125,000. The total silver coinage in 1914 amounted to 50,315,073 pesos.

EDUCATION. The total enrollment in the public schools for the year ending March 31, 1915, was 610,519, and the average daily attendance was 441,742. Sixty-five American teachers were appointed in 1914. All other vacancies were filled by the appointment of Filipinos. There was at the end of the year 232 Filipinos and 196 Americans engaged as supervising, industrial, or general teachers, and the total teaching force was composed of 539 Americans and 9306 Filipinos, a total of 9845. The work of industrial instruction was extended during the year, and at its close in addition to 806 students in the school of arts and trade, there were 106 American and 726 Filipino industrial teachers engaged in the schools throughout the Islands. The attendance in the college department of the University of Philippines at Manila reached 1164 in 1914, and that of the normal schools, 1833, the arts and trade school, 806, and the school of household industries, 146. The expenditure for school purposes in 1914 was 3,868,401 pesos.

HEALTH AND SANITATION. During 1914 the principal activities of the Bureau of Health were: its campaign against soil pollution; for pure water supplies for towns and villages; and against a threatened epidemic of cholera. Cholera appeared at Manila in July, and shortly after in separated points of Luzon. At the close of the year it was almost entirely stamped out. In addition to the general hospital at Manila, the Bureau of Health maintains three first-class and four smaller hospitals in provincial towns, also three hospitals and 47 dispensaries in the departments at Mindanao and Sulu. Vaccination and municipal sanitation are being rapidly carried on in that department.

TRANSPORTATION. The only railway construction during 1914 was the extension of the lines of the Manila Railroad Company in Luzon.

POLITICS AND GOVERNMENT. The transfer of the government of the Moro Province, now known as the Department of Mindanao and Sulu, from military to civil control has been followed by excellent results. Peace and order prevailed in the department throughout the year. In order to accomplish the complete unification of the people of the Moro Province with other inhabitants of the Archipelago, the policy has been adopted of extending to the department the general laws of the Islands, and the general forms of government followed in other provinces, sub-

ject to such limitations for the time being as are made necessary by special local conditions.

A bill providing for the government of the Philippines, which was introduced in the House of Representatives on July 11, 1914, did not receive action during that session of Congress. It was reintroduced during the following session, but did not reach a vote prior to the end of the 63rd Congress on March 4, 1915.

There were no serious disturbances in 1915. Ricarte, an exile who had carried on a propaganda of revolt for some time, was arrested on April 3rd at Shanghai, charged with instigating trouble in the neighborhood of Manila. Twelve participants in an uprising which took place on Christmas eve in 1914 in the vicinity of Manila were found guilty, and sentenced to various terms of imprisonment in May, 1915.

OFFICERS. There were no changes in the personnel of the Philippine Commission or Supreme Court in the year ending Dec. 31, 1915. The Commission was composed of: Governor-General and President of the Commission, Francis Burton Harrison; Vice-Governor and Secretary of Public Instruction, Henderson S. Martin; Secretary of Finance and Justice, Victorino Mapa; Secretary of Commerce and Police, Clinton L. Riggs; Secretary of the Interior, Winfred T. Denison; members, Rafael Palma, Vicente Singeon Encarnación, Jaime C. de Veyra, and Vicente Ilustre.

PHILLIPS, ANDREW WHEELER. American educator and mathematician, died Jan. 20, 1915. He was born at Griswold, Conn., in 1844. He graduated from Yale in 1873 with post-graduate studies at that university, taking the degree of Ph.D. in 1877. In the same year he became tutor in mathematics at Yale; he was made assistant professor in 1891, and full professor in 1891. From 1895-1911 he was dean of the graduate school. He retired in the latter year as professor emeritus. He was joint author of many text books on mathematics, including, *Transcendental Curves* (1875); *Graphic Algebra* (1882); *The Elements of Geometry* (1896); *the Orbit of Swift's Comet* (1880); and he edited the *Connecticut Almanac* from 1882 to 1893.

PHILLIPS, STEPHEN. An English poet, born at Somertown, near Oxford, on July 28, 1868, and died on Dec. 9, 1915. He was educated at the Stratford and Peterborough grammar schools, studied for the civil service, and attended Queens' College, Cambridge, in 1886. In 1887 he joined F. R. Benson's company of Shakespearean players, in the rôles of Brutus, Iago, Prospero, and the Ghost in *Hamlet*. For a time he was a tutor to Wolfram and Needham's classes for army candidates. About 1890 he definitely adopted literature as a profession, and in that year published, with three other authors, a book of verse entitled *Primavera*. Then followed a blank verse rhapsody, *Eremus* (1894), which won the praise of the reviewers. His *Christ in Hades*, and *Other Poems* (1896; 4th ed., 1897), and *Poems* (1897; 13th ed., 1902), which was awarded a prize of 100 guineas by the London Academy as the best verse of the year, established his reputation among the younger poets of the day. The poem "Marpessa" in the latter volume was considered particularly noteworthy. Phillips then wrote a tragedy in blank verse, *Paolo and Francesca* (1899; 4th ed., 1900), for George Alexander of St. James's Theatre, and another tragedy, *Herod*

(1900), for Beerbohm Tree. In 1902 appeared a dramatic poem, *Ulysses*. During this period (1897-1902) Phillips enjoyed a considerable vogue, but his attempt to bring back poetry on the English stage was not entirely successful from the viewpoint of the dramatic critic. His subsequent poetry included: *The Sin of David* (1904); *Nero* (1906); *New Poems* (1907); *The Last Heir* (1908), a drama; *Pietro of Sienna* (1910); *The New Inferno* (1910); *The King* (1912); *Iole* (1913); *Lyrics and Dramas* (1913); *Panama, and Other Poems* (1915); *Armageddon* (1915), a war play. During his later years Phillips edited the *Poetry Review*, the journal of the Poetry Society. Consult William Archer, *Poets of the Younger Generation* (New York, 1902), and E. E. Hale, Jr., *Dramatists of To-day* (New York, 1905; 6th ed., 1911). See also DRAMA, AMERICAN AND ENGLISH; and LITERATURE, ENGLISH AND AMERICAN, Poetry.

PHILOLOGY, CLASSICAL. No complete account of classical philology in 1915 can be given at the present time. The great war in Europe interrupted the publication of periodicals and books; further, as the result of disturbed business and postal conditions, books and periodicals actually published have been slow in arriving in the United States. In the present account, therefore, greater stress than usual will be laid on American work, and some books and articles of 1914, passed over last year, will be considered.

To the *Loeb Classical Library* (see YEAR BOOKS for 1911, 1912, 1913, 1914) were added translations of Pindar (all the *Odes*, with the principal fragments), by J. E. Sandys; Hesiod, the Homeric Hymns, and the *Homeric* (in one volume), by H. G. Evelyn-White; Procopius (the first of six volumes), by H. B. Dewing; Plutarch, *Lives* (the first two of ten volumes), by B. Perrin; Xenophon, *Cyropædia* (second and concluding volume), by W. Miller; Ovid, *Heroides and Amores*, by G. Showerman; Cæsar, *Civil War*, by A. G. Peskett; Dio Cassius (the third of ten volumes), by E. Cary; Apuleius, *The Golden Ass*, W. Adlington's rendering, revised by S. Gaselee; Lucian (the second of eight volumes), by A. M. Harmon; Pliny, *Letters*, W. Melmoth's rendering, revised by W. M. Hutchinson. To the *Oxford Library of Translations* (see YEAR BOOKS for 1911, 1912, 1913, 1914) were added versions of Aristotle, *De Mundo*, by E. S. Forster, *De Spiritu*, by J. F. Dobson, *Ethica Eudæmia*, by T. Solomon; of Epictetus, *Discourses and Manual*, by P. E. Matheson; and of Sidonius, *Letters*, in two volumes, by O. M. Dalton. Important, too, is a translation, in America, of Jordanes, *Gothica*, by C. C. Mierow.

The results of research in classical fields by American scholars appear, for the most part, in the periodicals, in articles of varying length, often displaying wide erudition and involving much labor, rather than in books.

In vol. xxxvi of the *American Journal of Philology*, a periodical edited since its inception in 1879 by B. L. Gildersleeve, were published "Words of Speaking and Saying in the Indo-European Languages," C. D. Buck (a valuable study of the semantic development in various Indo-European languages of such words as say, speak, word, language, etc.); "Cæsar, Cicero, and Ferrero, II," E. G. Sihler (a severe arraignment of G. Ferrero's *Greatness and Decline of Rome*); "A Witticism of Asinius Pollio," G. L.

Hendrickson (a fresh attempt to interpret the meaning of the charge of "Patavinitas" brought by Asinius Pollio, the versatile Roman writer, against his younger contemporary, the famous historian Livy); "Catullus as an Elegist," A. L. Wheeler (a demonstration that Catullus was a real pioneer in Roman elegy, laying the foundations and in many respects clearly indicating the lines which his successors were to follow, and that Catullus's indebtedness to the Greeks is mainly in the sphere of form, not of content); "Menander's *Epitrepontes*," F. G. Alinson (a revision of the text of this play, recovered only a few years ago, with the aid of a newly discovered Oxyrhynchus fragment); "The Trojan War Again," B. O. Foster (a discussion of a view propounded by the Dutch scholar Van Leeuwen, that the Iliad tells the story of what happened a few weeks after the Achæans landed to attack Troy, not, as has been commonly held, the story of the tenth year of the war, and that the Trojan War was, in reality, a short war); "The Fatalism of the Greeks," Abby Leach (an attack on the current opinion that the Greeks were fatalists); "Quintus Curtius Rufus," R. B. Steele (an argument that this Roman author wrote during the first years of the reign of Alexander Severus); "Studies in the Financial Administration of Athens," A. C. Johnson. The reviews in this journal are often important contributions to the general subject treated by the book under review. So, in vol. xxxvi, we may note reviews of R. Kühner, *Ausführliche Grammatik der Lateinischen Sprache* (second edition, by Fr. Holzweissig and C. Stegmann), by E. B. Lease; of W. P. Mustard, *The Piscatory Eclogues of Jacopo Sannazaro*, by E. K. Rand; of A. Busse, *Socrates*, by W. A. Heidel; of C. Robert, *Edipus*, by B. L. Gildersleeve; of Valetton, *De Iliadis Fontibus et Compositione*, by G. M. Bolling. In the department of this periodical known as "Brief Mention," B. L. Gildersleeve makes, in every number, noteworthy contributions, over a wide range, to classical philology, especially in his comments on various books and on matters of syntax. In this periodical are given also abstracts of important German classical periodicals, e.g. of *Philologus*, by G. D. Kellogg; of *Rheinisches Museum für Philologie*, by C. W. E. Miller and W. P. Mustard; of *Rumania*, by G. C. Keidel; of *Hermes*, by H. C. Ebeling; and of *Glotta*, by F. Edgerton. On pages 483-487 may be found a valuable index of all the contributions on the subject of Greek and Latin syntax made to this journal, since its inception in 1879, by B. L. Gildersleeve.

From *Classical Philology*, edited by Paul Shorey, may be noted "Perjury before Athenian Arbitrators," G. M. Calhoun; "The Tradition of Pliny's Letters," E. T. Merrill (a sketch of the tradition of Pliny's *Letters* down to the era of the early printed editions); "The Historical Infinitive, III: Imitation and Decline," J. J. Schlicher; "The Modern Note in Seneca's Letters," R. M. Gummere; "The Oneness of the Homeric Language," A. Shewan; "Textual Problems in Aristotle's Meteorology," F. H. Fobes; "Some Sources of Comic Effect in Petronius," K. Preston; "Horace, Catullus, and Tigellius," B. L. Ullman; "Mediæval Versions of Aristotle's Meteorology," F. H. Fobes; "The Colonizing Policy of the Romans from 123 to 31 B.C.," F. F. Abbott; "The Four Senates of the Bœotians," R. J. Bonner; "The Significance of the Wing-En-

trances in Roman Comedy," Eleanor F. Rambo.

In vol. xlv of *The Transactions of the American Philological Association* we find, among other papers, the following: "The Year of Cæsar's Birth," M. E. Deutsch; "Apragopolis, Island-home of Ancient Lotus Eaters," W. B. McDaniel (the author identifies *Apragopolis*, mentioned by Suetonius, Augustus 98, with the island of Monacone: he holds that Monacone was, in Augustus's time, far larger than it is now: it has sunk in the last 1800 years, even as has the neighboring island of Capri); "Notes on Suetonius," J. C. Rolfe; "Sentence and Word," L. Bloomfield; "The Thank-offering and Greek Religious Thought," J. W. Hewitt; "Horace, Sermones, I, 1," C. Knapp; "Greek Rhetorical Terminology in Puttenham's *The Arte of English Poesie*," L. Van Hook; "Rhetorical Studies in the Arbitration Scene of Menander's *Epitrepontes*," J. W. Cohoon.

From *The Classical Journal*, vols. x-xi, we name "The Influence of Festival Arrangements upon the Drama of the Greeks," R. C. Flickinger; "Xenophon's Comrades in Arms," R. J. Bonner; "Thoughts on the Reliability of Classical Writers, with Especial Reference to the Size of the Army of Xerxes," J. A. Scott; "The Ancient Appreciation of Mountain Scenery," W. W. Hyde; "Some Glimpses of the Raetian Limes," Katharine Allen. From *The Classical Weekly*, vols. viii-ix, the following must be named: "The Prosecution of Sextus Roscius," and "The Prosecution of Milo," R. W. Husband; "The Pastoral Ancient and Modern," W. P. Mustard; "The 'Passing' of the Sequence of Tenses," R. G. Kent; "Quotations from Greek Literature in Recently Published Inscriptions," K. K. Smith; "An Analysis of Cicero, *Cato Maior*," C. Knapp (pages 177-178, 185-186); reviews of C. E. Bennett, *The Syntax of Early Latin*, vol. ii—*The Cases*, by A. L. Wheeler; of A. W. Pickard-Cambridge, *Demosthenes and the Last Days of Greek Freedom*, by C. D. Adams; of T. R. Holmes, *C. Iulii Cæsaris Commentarii Rerum in Gallia Gestarum*, by G. Lodge; of F. M. Cornford, *The Origin of Attic Comedy*, by R. C. Flickinger.

In *Harvard Studies in Classical Philology*, vol. xxvi, appeared "Quo Modo Aristophanes Rem Temporalem in Fabulis Suis Tractaverit," O. J. Todd (a discussion of the unity of time in Aristophanes); "The Roman Magistri in the Civil and Military Service of the Empire," A. E. R. Boak; "Notes on the Fourth and Fifth Centuries," G. W. Robinson.

Mention may be made here of the classical material in the revised edition (second) of *THE NEW INTERNATIONAL ENCYCLOPÆDIA*. The very wide array of articles in this work in all the various departments of classical philology has been carefully revised by Charles Knapp. In 1914-15 16 volumes of this revised edition appeared.

In the seventh paragraph of last year's article reference was made to several works which aim to give control of publications in the field of classical philology. A glance at any of these works published since Jan. 1, 1915, will show how grievously the great war in Europe has interfered with scholarly work in classical philology and with efforts to keep abreast of such work and to appraise it. It may be noted here that *The American Historical Review* publishes some reviews of books in the field of ancient history, and gives in each quarterly number a brief

list of important books and articles in that department. *The American Journal of Philology* and *The Classical Review* give in each issue a list of recent classical books.

In the field of inscriptions mention may be made of Therese Stern, "Zur Formenlehre der Priensischen Inschriften," published in *Glotta*, vol. vi, an elaborate paper; H. Collitz and O. Hoffmann, *Sammlung der Griechischen Dialekt-Inschriften*, parts of vols. iii and iv; E. Ritsch, *Grammatik der Delphischen Inschriften*, vol. i, *Lautehre*; *Inscriptiones Græcæ, ad Res Romanas Pertinentes*, vol. iv, edited by R. Cagnat and G. Lafaye; "Inscriptions from Locris" (in Greece), W. A. Oldfather; "Inscriptions from the Acropolis of Hale" (in Locris, Greece), Hetty Goldman (the last two papers appeared in *The American Journal of Archaeology*). Reference should be made also to Ruggiero's *Dizionario Epigrafico di antichità Romana*, which has reached the letter H, and gains added importance from the unfortunate interruption by death of G. N. Olcott's *Thesaurus Lingue Latine Epigraphicæ* (see YEAR BOOK for 1911). A detailed account of the latest important finds in inscriptions, Greek and Roman, may be found in *The Year's Work in Classical Studies* (see YEAR BOOK for 1914).

In the field of palæography American scholars are rapidly making their mark. Here belong the great work of E. A. Loew, *The Beneventan Script* (see the YEAR BOOK for 1914); *Roman Cursive Writing*, H. B. Van Hoesen; *The Manuscript Tradition of the Historia Augusta*, Susan H. Ballou; and the edition of *Ammianus Marcellinus*, C. U. Clark (see the YEAR BOOK for 1910). An important work by an English scholar is *Notæ Latine*, W. M. Lindsay (an account of abbreviation in Latin manuscripts of the early minuscule period, i.e. from about 700-850 A.D.). Mention should be made also of the *Oxyrynchus Papyri*, Part X (see *The Year's Work in Classical Studies*, 9, 39-40, and *The Classical Review*, 29, 60-61), and Part XI; *Die ältesten Lateinischen und Griechischen Papyri* Wiens, C. Wessely; *Papyri Greci e Latini*, vol. iii (published at Florence); *Papyri Greco-Egizi, pubblicati dalla R. Accademia dei Lincei*, vol. iii, edited by D. Comparetti and G. Vitelli (this volume gives "documenti e testi letterarii dell' Età romana e bizantina"); *Index to Facsimiles in the Palæographical Society Publications* (Princeton), L. R. Dean; *A Collotype Reproduction of . . . the Codex Traguriensis, which contains the Cena Trimalchionis of Petronius*, etc., G. Gaselee (reviewed by R. V. D. Magoffin in *American Journal of Philology* 36, 213-215); *Codices Graeci et Latini phototypice depicti duce . . . Scatone de Vries* (vol. xix of the great series of facsimiles published by A. W. Sijthoff, at Leyden: it gives "Ciceronis Operum Philosophicorum Codex Leidensis Vossianus Lat. Fol. 84"); *Veröffentlichungen aus der Papyrussammlung zur München. I, Byzantinische Papyri*, by A. Heisenberg and L. Wenger; T. W. Allen, "Manuscripts of Strabo at Paris and Eton," in *The Classical Quarterly*. In the field of philosophy and religion we may note that A. W. Cook's important work, *Zeus, A Study in Ancient Religion*, vol. i, *Zeus, the God of the Bright Sky* (see YEAR BOOK for 1914) has won, in the main, favorable comment from the reviewers: see, e.g., A. W. Pickard-Cambridge in *The Classical Review*, 29, 80-85, and R. W. Tukey in *The American Journal of*

Philology, 36. 459-461. For a good review, by R. B. English, of J. Burnet, *Greek Philosophy, Part I: Thales to Plato*, a book named last year, see *The Classical Weekly*, 9. 91-96. To be mentioned also are Henri Graillot, *Le Culte de Cybèle, mère des dieux, à Rome et dans l'Empire Romain*, a large work; an article in *Hermes*, by G. Wissowa, "Die römischen Staatspriestertümer Altlateinischer Gemeindegulte" (an examination of the *sacra* of Alba Longa, Cabum, Cænina, Lanuvium, Tusculum, etc., under Roman rule); S. Eitrem, *Opferitus und Voropfer der Griechen und Römer* (published at Christiania). Volume v of Roscher's *Lexikon der Griechischen und Römischen Mythologie* made progress; the work has now reached the letter T.

W. M. Lindsay's useful book, *A Short Historical Latin Grammar*, reached a second edition. F. Sommer's standard work, *Handbuch der Lateinischen Laut- und Formenlehre*, reached in parts a second, in parts a third edition. A notice by E. H. Sturtevant of this work and of the supplementary volume, *Kritische Erläuterungen*, to which Sommer relegates the discussion of moot questions, will appear in *The Classical Weekly*, vol. ix. The third part was published of *Forschungen zur Griechischen und Lateinischen Grammatik*, edited by P. Kretschmer and W. Kroll; this part deals with the use of the subjunctive and the optative in principal clauses in the Greek dialects. We may note also J. Samuelsson, "Die Lateinischen Verba auf -iläre (-iläre)"; H. Bergfeld, "Das Wesen der Lateinischen Betonung," and G. Jachmann, "Zur Altlateinischen Prosodie," a discussion of bacchiac and cretic rhythms in early Latin. The last three articles appeared in *Glotta*, vol. vii. *Glotta*, vol. vi, No. 4, was taken up entirely with "Literaturbericht für das Jahr 1912," a conspectus of the books and articles published in 1912 in the fields of Greek and Latin grammar, lexicography, prosody, meter, linguistics, and allied subjects. To be named also are S. Feist, *Kultur, Ausbreitung und Herkunft der Indo-Germanen* (1913), the most important work recently published on the Indo-Germanic peoples; in 1914 the same author published *Indo-Germanen und Germanen*. In paragraph 6 above, reference was made to a paper in *The American Journal of Philology*, on "Sentence and Word," by a young American scholar, L. Bloomfield; here we must name a book by the same author, *The Study of Language*.

In 1914 Th. Zielinski, well known for his epoch-making studies in the rhythm of Latin prose, completed his great task by publishing "Der Constructive Rhythmus in Cicero's Reden: Der Oratorischen Rhythmik Zweiter Teil," a work forming Supplement-Band XIII to the periodical called *Philologus*. In *The Classical Quarterly*, A. W. de Groot published "Methodological Investigations into the Rhythm of Greek Prose."

At the end of 1913 appeared the first volume of an important new annual, *Indogermanisches Jahrbuch*, designed as an annual review and bibliography of work in Indo-Germanic comparative philology. It contained separate bibliographies for each group of the Indo-Germanic languages, for comparative philology in general, and, finally, special articles on the new languages brought to light by researches in Turkestan.

In the field of lexicography little can be reported now. Reference was made above to Rug-

giero's *Dizionario Epigrafico*, and to Roscher's *Lexikon der Griechischen und Römischen Mythologie*, as progressing slowly. In 1914 appeared Part 12 of Emile Boisacq's great work, *Dictionnaire Etymologique de la Langue Grecque*, covering *αἰῶνος* to *ρέσας*. Important, too, is Chr. Favre, *Thesaurus Verborum quæ in Titulis Ionicis leguntur cum Herodoteo Sermonem Comparatus*.

In the field of ancient history much valuable work has been done. A most important book, published in England in 1913, in America in 1914, is E. H. Minns's *Scythians and Greeks*, a survey of ancient history and archaeology on the north coast of the Euxine from the Danube to the Caucasus. The numismatic sections in this work give a compendious account of the coinage of the Hellenic settlements round the north coast of the Black Sea and their various offshoots. The Columbia University Press published W. B. Fleming's *The History of Tyre, and Hellenic Civilization*, by G. W. Botsford and E. G. Sihler, with contributions by W. L. Westermann, Charles J. Ogden, and others (the book forms the opening volume of a very extensive work, *Records of Civilization: Sources and Studies*, edited by J. T. Shotwell, and gives a translation of various ancient documents valuable for the light they throw on the civilization of the Greeks). Mention must be made of Jean Juster, *Les juifs dans l'Empire Romain*; Cavaignac, *Histoire de l'Antiquité*, vol. iii, covering the history of Greece, Rome, and Judæa in the period 330-107 B.C.; A. Bouché-Leclercq, *Histoire des Seleucides* (363-64 B.C.), Part 2; René Dussaud, *Les civilisations préhelléniques dans le bassin de la mer Égée*, 2nd edition (reviewed by W. Miller in *Classical Philology*, 10. 460-462); H. R. Hall, *Ægean Archaeology* (in 1913 the same author published *The Ancient History of the Near East*); F. Sartiaux, *La guerre de Troie et les origines préhistoriques de la question d'Orient*; C. N. Rados, *Les guerres médiques: la bataille de Salamine*. In the last days of 1915 appeared a most interesting book, *Homer and History*, by Walter Leaf, the well known English banker and classical scholar, giving the N. W. Harris lectures which Dr. Leaf was to deliver, in the fall of 1914, at Northwestern University, but which his duties, as member of a committee to finance the British Empire in the great war in Europe, prevented him from delivering.

In Roman history and allied fields we may notice M. Mayer, *Apulien vor und während der Hellenisierung*; E. Pais, *Storia critica di Roma durante i primi cinque secoli* (this deals with the early Republic, the decemviral legislation, the wars against the Æqui, the Volsci, and the Etruscans); id., *Ricerche sulla storia e sul diritto pubblico di Roma* (five of the studies in this volume deal with the Laws of the Twelve Tables); J. Toutain, "Antiquités Romaines, 1913-1914," and C. Lécrivain, "Antiquités Latines, Publications Étrangères, 1913-1915" (the last two articles appeared in the *Revue Historique*); W. H. Schoff, *The Parthian Stations of Isidore of Charax* (a study of the overland trade route in the first century B.C. between the Levant and India, Section 3 of the graphic history of commerce, published by the Commercial Museum of Philadelphia). This section gives the Greek text, a translation, and a commentary. Section 2 of this work is the *Periplus*

of the *Erythraean Sea*, translated by the same author (see the *YEAR BOOK* for 1912, page 532); Franz Leifer, *Die Einheit des Gewaltgedankes in Römischen Staatsrecht: ein Beitrag zur Geschichte des Öffentlichen Rechts* (an argument that the Romans of the Republic had a definite idea of the unity of the imperium); P. Fraccaro, *Studi sull' età dei Gracchi*; C. Lanzani, *Mario e Silla, Storia della democrazia negli anni 87-82 av. Cristo*; C. B. Coleman, *Constantine the Great and Christianity: Three Phases: The Historical, the Legendary, and the Spurious*. To be named also are M. Camille Jullian, *Histoire de la Gaule*, vol. iv (dealing with "Le Gouvernement de Rome"); W. A. Oldfather and H. V. Canter, "The Defeat of Varus and the German Frontier Policy of Augustus," in the *University of Illinois Studies in the Social Sciences*, vol. iv; F. Haverfield, *The Romanization of Roman Britain*, 3rd ed.; id., *Roman Britain in 1914*; B. E. Hammond, *Bodies Politic and Their Governments*.

The important work of J. H. Lipsius, *Das Attische Recht und Rechtsverfahren*, was completed by the publication of the concluding portion of vol. iii. Published in 1914, but obtained only with difficulty in 1915, were Pauly-Wissowa-Kroll, *Real-Encyclopädie der Classischen Altertumswissenschaft*, *Siebzehnter Halbband* (covering "Hyaia" to "Imperator"), and *Zweiter Reihe, Erste Halbband* (covering "Ra" to "Ryton"); for a notice of these volumes see R. H. Tukey in *The Classical Weekly* 9. 70-71.

In the field of Greek and Latin literature, we must mention W. Ridgeway, *The Dramas and Dramatic Dances of Non-European Races in Special Reference to the Origin of Greek Tragedy* (a sequel to the same author's *Origin of Tragedy*, and intended to give support to the theory of the origin of Greek tragedy advanced in the earlier work); M. S. Dimadale, *A History of Latin Literature* (useful, because it covers both prose and verse down to the time of Rutilius Numatianus, but marred by various blemishes); H. Peter, *Veterum Historicorum Romanorum Reliquiae*, vol. i, 2nd ed. (a valuable discussion of the earlier Roman historians, whose works are known to us only in fragments: the first edition was published in 1870). In the second edition appeared, too, A. E. Zimmern, *The Greek Commonwealth*, and R. W. Livingstone, *The Greek Genius and Its Meaning to Us*. We may note also J. J. Chapman, *Greek Genius and Other Essays* (the title essay takes issue, in an interesting way, with Gilbert Murray's versions of Euripides, and the ideas that underlie them); Mrs. Arthur Strong, *Apotheosis and After Life*; W. Scott, *The Last Sibylline Oracle of Alexandria*; Fr. Buecheler, *Kleine Schriften*, vol. i. Important to the classical student and to the general reader both is J. E. Sandys, *A Short History of Classical Scholarship* (a condensation and revision, in one volume, of the author's larger work, in three volumes, *A History of Classical Scholarship*, 1906-08).

Books or articles dealing more particularly with individual authors, Greek or Roman, are Ulrich von Wilamowitz-Moellendorf, *Aeschyli Tragædiæ* (text edition); id., *Aischylos, Interpretationen*; H. E. Butler and A. S. Owen, annotated edition, the first in English, of Apuleius, *Apologia*; F. Calonghi, "The Prologue of the 'Metamorphoses' of Apuleius," in *Rivista di Filologia e d'Istruzione Classica* (a minute examination of the opening chapter of the *Metamorpho-*

ses: the author holds that in this chapter there are two speakers; he refuses also to identify Lucius, the hero of the tale, with Apuleius himself); J. L. Heiberg, text of *Archimedis Opera Omnia*, vol. iii; L. L. Forman, annotated edition of Aristophanes, *Clouds*; J. W. White, elaborate edition of the *Scholia on the Aves of Aristophanes*; H. Richards, "Aristotelis," in *The Classical Review*; H. Meusel, a new annotated edition of Cæsar, *De Bello Gallico I-IV* (a very valuable work, technically the 17th edition of Fr. Kraner and W. Dittenberger, *De Bello Gallico*, Part 1); E. Norden, *Ennius und Vergilius* (the book contains "Kriegsbilder aus Roms Grosser Zeit"); L. Havet, *Notes Critiques sur le texte de Festus*; R. Foerster, text of *Libanii Opera Omnia*, vol. viii; S. Sudhaus, *Menanderstudien*; L. Cohn and P. Wendland, text of *Philonis Alexandri Opera*, vol. vi; Th. Bergk, *Poetæ Lyrici Graeci*, vols. ii and iii, new impression; H. W. Garrod, "Notes on the 'Naturales Quaestiones' of Seneca," in *The Classical Quarterly*; C. Robert, *Ædipus* (a work on Sophocles, discussed by B. L. Gildersleeve, in *American Journal of Philology*); G. E. K. Brauholtz, "The Nationality of Vergil," in *The Classical Review* (an argument, based on a study of Vergil's own name and the names of other members of his family, against the view that Vergil was of Celtic origin). Useful to students of Roman comedy (Plautus and Terence especially) is C. Knapp, "The Roman Theater," in *Art and Archaeology*.

PHILOLOGY, MODERN. It was indicated in these columns last year that there were prospects of a decided change in philological method during the course of the next few years. This development, so important for the evolution of the science, has been almost completely checked by the intensity of the war. Probably no field of human knowledge has a greater number of names on the casualty lists than philology, whose losses have been appalling. As nearly all of these men belong to the younger generation which was expected to effect this revolution, we are now beginning to ask ourselves if this movement is not destined to undergo entire arrestment of development. The probabilities are, however, that, though retarded for the moment, the revolution, when it does take place, will be all the more rapid and radical.

Besides the points mentioned in our article of last year, it is to be hoped that there will also be some effort toward a thorough systematization of the productions of candidates for the doctorate. Up to the beginning of the war the supply of German doctoral dissertations seemed inexhaustible. They were not only decidedly inferior in quality to those accepted some 30 years ago by the same institutions, but some might be considered as trivial, and would certainly not be accepted in any leading American university. Furthermore, there seems to have been no effort of any consequence to sift out and utilize whatever data were contained in them. After the cessation of hostilities Germany will no doubt retrieve herself from the scholarly point of view, and may possibly recover the doctoral dissertation from the pit of ludicrous mediæval scholasticism into which it has fallen of late years. Then and only then will the German Ph.D. resume the high esteem which it has completely lost.

At the close of the year 1914 some difficulty was experienced in the preparation of the article

on Modern Philology because the last numbers of many of the most important European philological reviews had not yet reached this country. The same is also true of the present year, so that this bibliographical résumé comprises titles which reached us too late for insertion in 1914, and those of 1915 as late as the early autumn. Whenever no date is given, it is to be understood that the work was issued in 1915.

Among the works of a more or less general character which have recently appeared, probably the most important is the new edition of Wundt's *Völkerpsychologie* (Leipzig) which contains *Eine Untersuchung der Entwicklungsgesetze von Sprache, Mythos und Sitte*. Sandfeld-Jensen's *Die Sprachwissenschaft* (Leipzig) is a useful work, as is also Wähmer's *Sprachlernen und Sprachwissenschaft* (ib., 1914). Bally's pamphlet, *Ferdinand de Saussure* (Geneva), gives a very succinct and comprehensive account of the actual state of linguistic studies, while Broens discusses the relative value of the leading theories of some 15 years ago in his *Darstellung und Würdigung des sprachphilosophischen Gegensatzes zwischen Paul, Wundt, und Marty* (Bonn). Other works of importance are Steyrer, *Der Ursprung und das Wachstum der Sprache der indogermanischer Europäer* (2nd ed., Vienna, 1914); and Kappert, *Psychologie des neusprachlichen Unterrichts* (Leipzig).

Outside the Indo-European field, but of particular interest to Americans, is Sinclair's interesting compilation of gypsy words under the title *American-Romani Vocabulary* (New York). On the American Indian languages we have received three important pamphlets by E. Sapir, entitled *Sketch of the Social Organization of the Nas River Indians; Abnormal Types of Speech in Nootka; and Noun Reduplication in Comos, a Salish Language of Vancouver Island* (Ottawa). McLaren's *Concise Kaffir-English Dictionary* (New York) is a very useful work.

SANSKRIT. The most important contribution to this field is without doubt Risley's *Peoples of India* (2nd ed., London), especially valuable for the history of caste. Rapson's *Ancient India* (Cambridge, 1914), and L. D. Barnett's *Antiquities of India* (London, 1913), a very useful work, should not be overlooked. Noteworthy contributions to the history of Indian religion are Oldenberg, *Die Lehre der Upanishaden und die Anfänge des Buddhismus* (Göttingen); Farquhar's *Religious Movements in India* (New York); Macnicol, *Indian Theism* (London) from the Vedic to the Mohammedan period; and Mrs. S. Stevenson, *The Heart of Jainism* (ib.). J. H. Woods, *The Yoga-System of Patanjali* (Cambridge, Mass., 1914) is a translation of a philosophical work well known to Indianists, while Strangways, *The Music of Hindostan* (Oxford, 1914) consists of selections of native music. Other works worthy of note are S. S. Thera's edition of the *Dhammapada* (London, 1914); D. Chandra Sen's *Vaga Sahitya Perichaya, or Typical Selections from Old Bengali Literature* (2 vols., Calcutta, 1914); *Khuddaka-Patha*, a Pali text edited by Helmer Smith (London). In this connection may be mentioned the Malay text *Hikayat Pelandok*, edited by O. T. Dussek (Singapore).

SLAVIC. Among the few works of importance that have appeared in this field we may note F. Sommer's *Die indogermanischen id- und io-Stämme im Baltischen* (Leipzig, 1914); Agrell,

Zur Erklärung der serbokroatischen Endung -a beim Genitiv Plural (ib.); the first part of O. Leskien's *Grammatik der serbokroatischen Sprache* (Heidelberg, 1914); and Marak's useful little *Deutsch-kroatisches und Kroatisch-deutsches Wörterbuch* (Vienna). In Russian we have the following two manuals of especial value to the beginner: Friedrichs, *Kurzgefasste systematische Grammatik der russischen Sprache* (Berlin), and W. Loewenthal, *Lehrbuch der russischen Sprache* (Leipzig). Of interest to the philologist is Stur's *Die slavischen Sprachelemente in den Ortsnamen der deutsch-österreichischen Alpenländer* (Vienna, 1914).

CELTIC. Through oversight we failed to call attention last year to A. Morel-Fatio's *Notice sur la vie et les travaux de M. d'Arbois de Jubainville* (Nogent-le-Rotrou, 1913), which contains a full account of the long and very active life of this eminent pioneer in the field of Celtic studies. It is worthy of note that to this distinguished scholar fell the honor of occupying the first chair in Celtic created in a continental university—that of the Collège de France. D'Arbois's reputation is firmly established by his work in the literature, laws, and social customs of the ancient Celts. The most important contribution to the field of Celtic research is the new edition of Dottin's excellent *Manuel pour servir à l'étude de l'antiquité celtique* (Paris), a most serviceable work for the neophyte as well as the adept. Dr. J. Gwinn's *Book of Armagh* (Dublin, 1913), and Parry-Williams's *Some Points of Similarity in the Phonology of Welsh and Breton* (Paris, 1913) should have been noted last year. In Gaelic Scotch we have D. Maclean's *Typographia Scoto-Gadelica, or Books printed in the Gaelic of Scotland from 1567 to 1914* (Edinburgh), a valuable bibliography, and A. Carmichael's *Deirdre and the Lay of the Children of Uisne* (Paisley, 1914), consisting of versions, with translation, collected in the Island of Barra. Of interest to the student of the Welsh saga is Dostal-Winkler's *Der Heimat der Gralsage, vom Standpunkte der Völkerpsychologie und vergleichenden Mythenforschung* (Kremsier), begun in 1914 and of which the second part has just appeared. To the same line belong J. M. Clark's *Legends of King Arthur* (London); Gaede, *Die Bearbeitungen von Chrestiens Erec und die Mabinogionfrage* (Münster); Passerini, *Il Romanzo di Tristano e Isotta ricostituito* (Milan). In Breton a useful work for the folklorist is Cadic, *Contes et Légendes de Bretagne* (Paris), of which the 11th series was issued.

GERMANICS. Few general works of importance have appeared in this field of research during the course of the year 1915. Among those deserving of mention, however, are the following: Kossinna, *Die deutsche Vorgeschichte* (2nd ed., Würzburg, 1914); W. Fischer, *Die deutsche Sprache von heute* (Leipzig, 1914); the 8th ed. of the *Etymologisches Wörterbuch* of Kluge, begun in 1914, was completed (Strassburg); L. Schmidt, *Geschichte der deutschen Stämme bis zum Ausgange der Völkerwanderung* (2nd part, Berlin); and the second volume of the *Reallexikon der germanischen Altertumskunde*, under the editorship of Hoops, was at last finished. Works of a more special nature treat rather of syntax, as for example, Hastenpflug, *Das Diminutiv in der deutschen Original-literatur des 12. und 13. Jahrhunderts* (Marburg, 1914); Krömer, *Die Präpositionen in der hoch-*

deutschen *Genesis* und *Exodus* (Leipzig, 1914); Rhein, *Mixed Preterites in German* (Göttingen); F. Baumann, *Die Adjektivabstrakta im älteren Westgermanischen* (Freiburg, 1914); N. J. Clark, *Beiträge zur Geschichte der periphrastischen Konjugation im Hochdeutschen* (Heidelberg, 1914); Heims, *Der germanische Alliterationsvers und seine Vorgeschichte* (Münster, 1914); H. Naumann, *Kurze historische Syntax der deutschen Sprache* (Strassburg); Guericke, *Die Entwicklung des althochdeutschen Participiums unter dem Einflusse des Lateinischen* (Königsberg); Lucas, *Das Adjektiv bei Ulrich von Lichtenstein* (Greifswald); Schwentner, *Eine sprachgeschichtliche Untersuchung über den Gebrauch und die Bedeutung der altgermanischen Farbenbezeichnungen* (Göttingen); Krtler, *Der Bindevokal und seine Fuge im schwachen deutschen Praeteritum bis 1150* (Berlin, 1914); Giese, *Untersuchungen über das Verhältnis von Luthers Sprache zur Wittenberger Druckersprache* (Halle); Grüniger, *Die Betonung der Mittelsilbe in dreisilbigen Wörtern* (Freiburg, 1914); Krönig, *Die beordnenden adversativen Konjunktionen des Neuhochdeutschen* (Giessen); and A. Wolf, *Das Präfix 'us-' im gotischen und im deutschen Verbum* (Breslau). Dialects, however, claimed the attention of the Germans for the most part. This is due to the fact that this is about the only field in Germanic philology which has not been thoroughly studied. As texts of the old Germanic dialects are very limited in number, it was not long before scholars had studied them from every point of view. Though the number of German dialects is very large, we can easily foresee the time when they too will be exhausted. Possibly then German scholars will attempt to coördinate this inchoate mass of material, and may be able to deduct some principles of value. In the extensive list of dialect studies, consisting mainly of dissertations, the following may be noted: F. Wilhelm, *Nordbayrische Urkunden* (Munich, 1914); Altrichter, *Die Dorfnamen in der Iglaner Sprachinsel* (Iglau, 1914); Halter, *Die deutsche Sprache im Elsass auf historischer Grundlage* (Jena, 1914); Brand, *Studie zur Dialektgeographie des Hochstiftes Paderborn* (Munich, 1914); Kopperschmidt, *Die Sprache der Hildesheimer Urkunden* (Marburg, 1914); Reichert, *Lautlehre der Mundart von Mönchzell* (Freiburg, 1914); M. Martin, *Die französischen Wörter im Rheinheßischen* (Giessen, 1914); Semrau, *Die Mundart von Koschneiderei* (Breslau); Wrede, *Deutsche Dialektgeographie*, containing several studies on the Rhine dialects; Freiling, *Studien zur Dialektgeographie des hessischen Odenwaldes* (Marburg, 1914); Hackler, *Der Konsonantismus der Wittgensteiner Mundart* (Giessen, 1914); Hausenklas, *Grammatik der nordwestböhmisches Mundart* (Prague, 1914); Martin, *Untersuchungen zur rhein-moselfränkischen Dialektgrenze* (Marburg, 1914); Schmid, *Die Mundart des Amtes Entlebuch im Kanton Luzern* (Frauenfeld); H. Sievers, *Die Mundart der Stapelholmer* (Marburg, 1914); Hodler, *Beiträge zur Wortbildung im Berndeutschen* (Bern); Reis, *Die deutsche Mundartdichtung* (Berlin); Mornau, *Lautlehre der deutschen Mundart von Szeghegy in Südungarn* (Budapest); Hommer, *Studien zur Dialektgeographie des Westerwaldes* (Marburg); Kroh, *Beiträge zur nassauischen Dialektgeographie* (ib.); Wenker, *Das rheinische Platt* (ib.);

Lobbes, *Nordberische Dialektgeographie* (ib.); Neuse, *Studien zur niederrheinischen Dialektgeographie* (ib.); Ehrhardt, *Die schwäbische Kolonie in Westpreussen* (ib.); Frühe, *Untersuchungen über den Wortschatz schweizerischer Schriftsteller des 18. und 19. Jahrhunderts* (Freiburg); Niblett, *Grammatik der Osnabrückischen Mundart* (Munich); and Engelmann, *Der Vokalismus der Mundarten im Gebiete um Rudolstadt unter Zugrundelegung der Mundart von Kirchhasel* (Jena). Among the various lexicographies we should note first of all the great *Deutsches Wörterbuch*, originally begun by Grimm, of which parts of vols. iv, x, xi, and xvi were issued (Leipzig). The fourth volume of H. Fischer's *Schwäbisches Wörterbuch*, going as far as the word *Nutzung*, was completed (Tübingen). Jellinghaus's edition of Förstemann's *Altddeutsches Namenbuch* (Bonn) has attained the 17th *Lieferung* of the second volume. The *Schweizerisches Idiotikon, Wörterbuch der schweizer-deutschen Sprache*, edited by a number of scholars, has almost reached the end of vol. viii (Frauenfeld). Other dictionaries of a less pretentious nature are the *Deutsches Rechtswörterbuch*, of which the first *Lieferung* as far as the word *ablegen* was issued at Weimar; Duben, *Kleines Wörterbuch der deutschen Rechtschreibung*, edited by A. C. Schmidt (Leipzig); W. James, *Wörterbuch der englischen und deutschen Sprache* (44th ed., ib.); Blüchmann, *Geflügelte Worte*, edited by Heichen (Berlin); and two amusingly chauvinistic works entitled *Los vom Fremdwort! Kleines Verdeutschungs-Wörterbuch*, edited by Eichhorn (Emmishofen); and Düssel, *Verdeutschungen: Wörterbuch fürs tägliche Leben* (Braunschweig). E. Sapir's *Notes on Judeo-German Phonology* (Philadelphia) is of great importance for the study of Yiddish in America. During the past few years the attention of scholars has been drawn more and more toward semantics, or the development of meanings of words. This very important branch of learning, which opens new vistas of the greatest possibility, was founded by the distinguished French scholar Michel Bréal, whose death occurred during the past year. Among the works belonging to this domain are Schwabe, *Semantic Development of Words for Eating and Drinking in Germanic* (Chicago); Hadlich, *Zur Theorie des sprachlichen Bedeutungswandels* (Halle); Sperber, *Studien zur Bedeutungsentwicklung der Präposition "über"* (Upsala); Tschinkel, *Der Bedeutungswandel im Deutschen* (Vienna, 1914); Waag, *Bedeutungsentwicklung unseres Wortschatzes* (3rd ed., Lahr).

In Low German, we note Haupt, *Untersuchungen zur niederdeutschen Dietrichsage* (Berlin, 1914); Hanenberg, *Studien zur neuen Dialektgeographie zwischen Nymegen und Urdingen* (Marburg); and Meier, *Beiträge zur Kenntnis des Niederdeutschen* (Münster). In Frisian, the only important work is Sipma's *Phonology and Grammar of Modern West Frisian* (London, 1914).

DUTCH. The great *Woordenboek der Nederlandsche Taal*, which has been in publication for a number of years under the editorship of the leading scholars of Holland, did not cease publication during the past year. Parts of vols. iii, vii, xii, and xiii made their appearance (The Hague). De Vries, *Studiën over faeröische Balladen* (Haarlem) is a useful study.

SCANDINAVIAN. The most important contri-

bution to the Norse-Icelandic section of this field of research is the *Lexicon poeticum antiquae linguae septentrionalis: Ordbog over det nordisk-islandske Skjaldesprog*, edited by Egilsson and Finnur Jónsson, of which the second hæfte appeared last year (Copenhagen). The latter editor also continued the publication of the second volume of *Den norsk-islandske Skjaldedigtning* (ib.). Attention should also be called to Blackley's translation of *Frithiofs Saga* (New York, 1914). Other works in Norse-Icelandic are Nordal, *Orkneyinga Saga* (Copenhagen), of which the second hæfte was published; Bugge and Olsen, *Norges Indskrifter med de ældre Runer* (Christiania, 1914); Pipping, *Till frågen om 'L' och 'n'-ljudens kvalitet i de nordiska Språken* (Helsingfors, 1914); Gering, *Glossar zu den Liedern der Edda* (4th ed., Paderborn); and Torp, *Nynorsk Etymologisk Ordbok* (Christiania) which has reached the letter F. Brøndun-Nielsen's *Sproglig Forfatterbestemmelse* (Copenhagen, 1914) is devoted to the Danish language of the sixteenth century. In Swedish, part of volume seven of Noreen's *Vårt Språk*, a compendious Modern Swedish Grammar, was issued (Lund). Among the studies relating to the early language the most important are Sahl-Sjöros, *Studier över fornvästgötska Lagteater* (Helsingfors, 1914); Brieskorn, *Konkret i fornsvenskan* (Skara, 1914); Friesen, *Grundragen av det svenska Språkets Historia* (Upsala, 1914); id., *Fornsvenska Paradigm* (ib., 1914); id., *Namnet Jönköping* (Jönköping); Beckman, *Principfrågor i svensk Språkhistoria* (Helsingfors, 1914); and Brieskorn, *Bidrag till den svenska namnhistorien* (Upsala), which treats of mediæval names. Other works of interest are Auerbach, *Svensk-Tysk Ordbok* (Stockholm); Bergroth, *Våra Provinsialismer* (Borgå); Elmquist, *Swedish Phonology* (Chicago); and Benson, *Old Norse Element in Swedish Romanticism* (New York, 1914). The *Svenska Studier tillägnade Gustaf Cederschiöld* (Lund, 1914) contains many articles of philological interest.

ENGLISH. The contributions to English philology have been less numerous than usual. No works of great consequence appeared, though there is much that is useful in one way or another. For example, Eikenkel's *Historische englische Syntax* (Strassburg) gives a good outline of the history of the subject. The 11th edition of Zupitza's *Alt- und Mittenglisches Übungsbuch*, edited by J. Schipper (Vienna and Leipzig), will be welcomed by German-speaking students among whom this is a favorite text. Other general works of importance are Wyld's *Short History of English* (London, 1914); F. H. Vizetelly, *Essentials of English Speech and Literature* (New York). The following contributions to Anglo-Saxon deserve mention: J. R. C. Hall, *Beowulf* (Cambridge, 1914), consisting of a metrical translation into Modern English; *Beowulf*, *angelsächsisches Heldengedicht*, translated into German by M. Heyne (3rd ed., Paderborn); Benedetti, *La Canzone di Beowulf, versione italiana* (Palermo); Kirtlan, *Beowulf* (London, 1914), consisting of a translation into Modern English prose; and *Beowulf*, in comparison with the Finnsburg fragment (Cambridge). Other studies in Anglo-Saxon are Rubens, *Parataxe und Hypotaxe in den ältesten Teil der Sachsenchronik* (Halle); Ley, *Der Lautwert des altenglischen 'C'* (Marburg, 1914); Wende, *Ueber die nachgestellten Präpositionen im Angelsächsis-*

chen (Berlin, 1914); Kluge, *Angelsächsisches Lesebuch* (4th ed., Halle); F. Olivero, *Traduzioni dalla Poesia Anglo-Sassone* (Bari); Schücking, *Untersuchungen zur Bedeutungslehre der angelsächsischen Dichtersprache* (Heidelberg); and Trautmann, *Die altenglischen Rätsel* (Heidelberg) which has been in publication for several years. In Middle and Modern English we note the following: Sanders, *Der syntaktische Gebrauch des Infinitivs im Frühmittelenglischen* (Kiel, 1914); A. S. Cook, *Literary Middle English Reader* (Boston); O. F. Emerson, *Middle English Reader* (new ed., New York, 1914); Hüttmann, *Das Partizipium Præsens bei Lydgate im Vergleich mit Chaucers Gebrauch* (Kiel, 1914); Schrader, *For- und fore-Verbalcomposita im Verlauf der englischen Sprachgeschichte* (Greifswald, 1914); Schlemilch, *Beiträge zur Sprache und Orthographie spätmittelenglischen Sprachdenkmäler der Vebergangszeit (1000-1150)* (Göttingen, 1914); Joerdan, *Das Verhältnis von Wort-, Satz- und Versakzent in Chaucer's Canterbury Tales* (Halle); A. G. Kennedy, *The Pronoun of Address in English Literature of the 13th Century* (Palo Alto, Cal.); Lausterer, *Der syntaktische Gebrauch des Artikels in den älteren mittenglischen Romanzen* (Kiel, 1914); and Stühr, *Der syntaktische Gebrauch der Präposition "for" im Frühmittelenglischen* (ib., 1914). The dialect studies are few in number and carefully prepared. Among them are Sir James Wilson, *Dialect of the New Forest in Hampshire* (Oxford, 1914); id., *Lowland Scotch as spoken in the Lower Strathearn District of Perthshire* (ib.); W. F. Bryan, *Studies in the Dialects of the Kentish Charters of the Old English Period* (Chicago); J. B. Johnston, *Place-names of England and Wales* (London); Goodall, *Place-names of South-West Yorkshire* (new ed., Cambridge); Sedgfield, *Place-names of Cumberland and Westmoreland* (London); Walker, *Place-names of Derbyshire*; *Dialect Notes of the American Dialect Society*, edited by Percy W. Long (vol. iv, part iii, Cambridge, Mass.); and Norman, *Glossary of Archæology* (2 vols., London), which contains many details of interest to the philologist. Useful manuals are Utter's *Guide to Good English* (New York); and Kirkpatrick, *Handbook of Idiomatic English* (2nd ed., Heidelberg), which is of special interest for travelers. Simplified spelling receives attention in Vizetelly's *Dictionary of Simplified Spelling* (New York); and Viglione, *La riforma dell' ortografia inglese* (Rome). Krüger's *Schwierigkeiten des Englischen*, which has often been mentioned here, is now nearing the end of syntax (Dresden and Leipzig). Finally among the dictionaries there is the practical *Routledge's New Dictionary of the English Language*, edited by C. Weatherby (London), while Goldingham's *Dictionary of Modern Naval Technical Terms, German-English and English-German* (London, 1914) should not be omitted. The following parts of Dr. Murray's *New English Dictionary* (Oxford) were issued during the year: January, part of vol. ix, *subterraneous*, by C. T. Onions; April, also vol. ix, *Spring-Squoye*, by W. A. Craigie, and *St-Standard*, by H. Bradley; July, part of vol. x, *Trink-Turn-down*; October, part of vol. ix, *Standard-Stead*, by H. Bradley. H. Harrison's concise etymological dictionary of the Surnames of the United Kingdom (vol. ii, London) is a most interesting work for the philologist and antiquarian.

ROMANCE. There were also but few works of a general nature that appeared in this field during the past year. Kabilinski's *Jacob Grimm als Romanist* (Greifswald) is one of a series of studies devoted to pioneer work in Romance philology. Noggler's *Romanische Familiennamen im Oberrheinischgau* (Meran, 1914) is, as its title indicates, of a dialectal nature. H. L. Cohen's *The Ballade* (New York) is an unsatisfactory and incomplete treatment of a very interesting subject. Ritter's *Die Geschichte der französischen Balladenformen von ihren Anfängen bis zur Mitte des 15. Jahrhunderts* (Jena, 1914) is of a more serious nature.

FRENCH. The most important work relating to French philology is without doubt the long-awaited publication of Tobler's *Altfranzösisches Wörterbuch*, the first fasciculus of which was issued under the editorship of Lommatzsch (Berlin). Foerster and Koschwitz's *Altfranzösisches Übungsbuch* (Leipzig) is a useful work for the student. Other works of note are Gilliéron's *Pathologie et thérapeutique verbales* (Neuveville); Nyrop's *Philologie française* (2nd ed., Copenhagen); and Grammont's *Le vers français* (Montpellier). Studies, both philological and syntactical, on early and modern French include Belz, *Die Münzbezeichnungen in der altfranzösischen Literatur* (Strassburg, 1914); Farber, *Die Sprache der dem Jean Renart zugeschriebenen Werke* (Halle); Gumbaut, *Altfranzösischer Artus-roman des 13. Jahrhunderts*, edited by Stürzinger and Brenner (ib., 1914); Ostrander, *Li Romans dou Lis*, edited by H. A. Todd (New York); Bacon, *The Song of Roland*, translated into English verse (New Haven, 1914); Gaede, *Die Bearbeitungen von Chrestiens Ereik und die Mabinogionfrage* (Münster, 1914); Waiblinger, *Beiträge zur Feststellung des Tonfalls in der romanischen Sprachen* (Halle, 1914); Engeroff, *Untersuchungen des Verwandtschaftsverhältnisses der anglo-französischen und mittellengischen Ueberlieferungen der "Usages of Winchester"* (Bonn, 1914); Frumholtz, *Sprachliche Untersuchungen zu Charles d'Orléans* (Jena); Schubert, *Form und Gebrauch der von Lat. "ante" abstammenden französischen Präpositionen* (Göttingen); Fabre, *La délivrance d'Orléans* (Paris), containing interesting remarks on the language of a mystery play of the fifteenth century; Gannilshieg and Spitzer, *Die Bezeichnungen der "Klette" im Galloromanischen* (Halle); Stimming, *Zur Accusativus cum Infinitivo im Französischen* (ib.); F. Behrens, *Umschreibung der Adverbialbildung durch die Verbindung Substantiv mit Präposition im Französischen* (Göttingen); Dey, *The Latin Prefa pro in French* (Univ. of North Carolina); Haupt, *Infinitivsätze im Französischen* (Marburg); Klein, *Die Wortstellung im Französischen* (Leipzig); Schwabe, *Vouloir + inf. als Umschreibung des Verbums und im Sinne von "pflegen"* (Göttingen); Treder, *Ueber die Verbindung von avoir und être mit intransitiven Verben* (Berlin); Zimmermann, *Die Syntax des Verbums bei Bernard Palissy* (Leipzig); Kellermann, *Französische Präpositionen in syntaktischer Verknüpfung untereinander* (Göttingen); and a new edition of E. C. Armstrong's *Syntax of the French Verb* (New York), a very complete text for the use of students. Dialects have thus far failed to receive the necessary attention from French scholars because they have been occupied with the publication of the numerous and valuable

texts in which French literature is so rich. In fact, no other modern literature can compare with the French in this regard. Nevertheless, some dialect studies have appeared, as, for example, Deneke, *Sprachverhältnisse und Sprachgrenzen in Belgien und Nordfrankreich* (Hamburg); Zaun, *Die Mundart von Aniane (Hérault) in alter und neuer Zeit* (Halle); Gütyler, *Der Lautstand in der allothringischen Uebersetzung der Homilien des Haimo von Halberstadt* (ib.); Frutaz, *Les origines de la langue française dans la vallée d'Aoste* (Aoste, 1913); Geddes, *Canadian French* (Erlangen, 1914); Dauzat, *Glossaire étymologique du patois de Vinzelles* (Montpellier); Kaspers, *Die mit den Suffixen -acum, -anum, -asum, und -usum gebildeten nordfranzösischen Ortsnamen lateinischer Herkunft* (Bonn, 1914); Maver, *Einfluss der vorchristlichen Kulte auf die Toponomastik Frankreichs* (Vienna); and Herzog, *Neufranzösische Dialekttexte* (2nd ed., Leipzig, 1914). Among the numerous dictionaries of the modern language we may note the handy little *Dictionnaire anglais-français, français-anglais*, edited by Hatier (Paris); Thomson, *Nouveau Dictionnaire français-anglais, anglais-français* (ib.); Blanchard, *Dictionnaire de bon langage* (ib., 1914); Besson and Hecker, *Vocabulaire systématique français-allemand* (Bonn); "Weekly Telegraph," *French-English and English-French Pronouncing Dictionary* (London), intended for the use of soldiers; and Sommer, *Petit Dictionnaire des synonymes français* (19th ed., Paris, 1914). Finally mention may be made of Olten, *Die Verwertung der Ergebnisse der Sprachwissenschaft im französischen und englischen Unterrichte* (Leipzig, 1914).

ITALIAN. There is also a marked paucity of works dealing with the philological side of Italian. In a general way we have Darchini, *Didattica del Linguaggio* (Milan, 1914); and Bertoni, *I Trovatori d'Italia* (Modena) which is interesting for certain points. As for dictionaries, the year was a productive one. Thus, we have two interesting studies on the vocabulary of the poet Giovanni Pascoli, the *Vocabolario Pascoliano* of Passerini (Florence), and the *Dizionario Pascoliano* of Capelli (Leghorn). Of a similar nature is the *Dizionario Carducciano* (Florence, 1914) of Liguori Pelli. Besides these there is Bacci, *Dizionario Italiano-Spagnuolo* (ib.); Hoare, *Italian Dictionary* (Cambridge); Meazzini, *Vocabolario Italiano-Esperanto* (Bologna, 1914); A. D. Lysle, *Dizionario della Lingua Italiana-Inglese* (2 vols., Turin, 1914); Callegari, *Dizionario Astra-Cosmografico Elementare* (Rocca). Several valuable dialect studies have also appeared, such as H. H. Vaughan, *Dialects of Central Italy* (Philadelphia); Da Ronco, *Voci Dialettali e Toponomastiche Cadorine* (Treviso, 1914); Falcucci, *Vocabolario dei Dialetti, Geografia e Costumi della Corsica*, edited by Guarnerio (Cagliari); Maccarione, *I Dialetti di Cassino e di Cervaro* (Perugia); Trauzzi, *Attraverso l'Onomastica del Medio Evo in Italia* (part ii, Rocca S. Casciano); Goidanich, *Ricerche etimologiche: denominazioni del pane e di dolci caserecci in Italia* (Bologna); Talmon, *Saggio sul dialetto di Prapelato* (Turin); Paura, *Quaderno di Vocaboli poco noti ma fra i più praticamente utili del vocabolario* (Palermo); Pecorella, *Vocabolario Numerico Siciliano-Italiano* (Milan), a curious work intended for the interpretation of dreams; Piase-

voli, *Del Dialecto Veneto di Zara* (part ii, Zara, 1914).

SPANISH. The most noteworthy contribution to Spanish philology is without doubt the new 14th edition of the *Diccionario de la lengua castellana*, by the Spanish Royal Academy (Madrid, 1914). Menéndez Pidal's *Manuel de gramática histórica española* (ib.), originally issued in 1904, has already passed through a third edition. Other works of a general character are Cejador y Frauca's *Historia de la lengua y literatura castellana desde los orígenes hasta Carlos V* (ib.); *Plan general para la redacción del Diccionario histórico de la lengua castellana* (ib., 1914); Rogerio Sánchez, *Resumen de historia de la lengua y literatura española* (ib.); Monner Sans, *De gramática y de lenguaje* (ib.); and C. R. Post, *Medieval Spanish Allegory* (Cambridge, Mass.). That Spanish philologists have been more active in recent years is evidenced by the fact that dialect studies are continually increasing in number as well as quality. The past year saw the completion of numerous important works, such as the *Diccionario gallego-castellano*, of which the first parts were issued by the Royal Galician Academy (Coruña); Umphrey, *The Aragonese Dialect* (Washington); Krüger, *Studien zur Lautgeschichte westspanischer Mundarten auf Grunde von Untersuchungen an Ort und Stelle* (Hamburg, 1914); Espinosa, *Studies in New Mexican Spanish: the English Elements* (part iii, Halle); Barrón, *Castabria y Logroño, estudio filológico-histórico* (Malaga); Wagner, *Beiträge zur Kenntnis des Judenspanischen von Konstantinopel* (Vienna); Sánchez Moguel, *El Lenguaje de Santa Teresa de Jesus* (Madrid); Dihigo, *El habla popular al través de la literatura cubana* (Havana); Aguiló y Fuster, *Diccionari Aguiló*, of which the first part was published at Barcelona (1914); and Castans, *Galicismos, Barbarismos, Hispanismos* (Madrid), which consists of a repertory of French locutions in use in popular language. Other works that may be noted are Cotarelo y Mori, *Diccionario biográfico y bibliográfico de calligrafos españoles* (ib., 1914); Reixach, *Rudimentos de Castellano y gramática latina completa* (Vich, 1914); Guzmán, *Gramática castellana; analogía* (Buenos Aires); E. de Hinojosa, *Elemento germánico en el derecho español* (Madrid); and Macdonald, *Spanish-English and English-Spanish Commercial Dictionary* (New York).

OTHER LANGUAGES. In Catalan we have the following: Oliva, *Introducción al estudio del Arte del Alfabeto en Cataluña* (Villanueva y Geltrú, 1914); Griera y Gaja, *La frontera catalano-aragonesa, estudi geográfico lingüístic* (Barcelona, 1914); and K. Marx, *Die katalanische Terminologie der Korkstopferzeugung* (Bonn, 1914).

In Provençal, the seventh volume of Levy's *Provençalisches Supplement-Wörterbuch*, going as far as *Suzurrat*, was completed (Leipzig). A. Jeanroy's *Les Joies du gai savoir* (Paris, 1914) contains some interesting texts.

In Rumanian there are two publications of first rank, Candrea and Densusianu's *Dictionarul etimologic al limbii romine* (Bucharest) of which the fourth part treating of the Latin elements was published; and Jonascu, *Gramaticii români* (Jassy), an historical grammar of the language from 1757 to the present day. Finally, it is well to note Torontsiu, *Liliput-Wörterbuch deutsch-rumänisch und rumänisch-deutsch* (Leip-

zig, 1914). In Rhaeto-Romance, two works should be mentioned, Stur's *Die slawischen Sprachelemente in den Ortsnamen der deutsch-österreichischen Alpenländer zwischen Donau und Drau* (Vienna, 1914); and Velleman, *Grammatica rhaeto-romanae Enaniae superioris pars I.* (Zurich) which treats of the lingua ladina of Engiadin' Ota.

PHONETICS. The most important works in this field are Passy's *French Phonetic Reader* (London, 1915); R. E. Bassett, *Spanish Pronunciation* (Cincinnati, 1914); and Viëtor, *Elemente der Phonetik des Deutschen, Englischen und Französischen* (6th ed., Leipzig). Useful manuals are Dumville, *Elements of French Pronunciation* (New York, 1914); S. A. Richards, *Phonetic French Reader* (ib.); Rippmann, *Early Teaching of French and First Steps in French* (London); C. K. Rogers, *English Diction: Part I, The Voice in Speech* (ib.); Zachrisson, *Pronunciation of English Vowels (1400-1700)* (Göteborg); Trautmann, *Kleine Lautlehre des Deutschen, Französischen und Englischen* (2nd ed., Bonn); Stefanini, *Studi italiani di fonetica sperimentale* (Padua); and Merlo, *Note di fonetica italiana meridionale* (Turin, 1914). Other works of a more general interest are H. E. Palmer, *What is Phonetics?* which consists of 12 letters from a phonetician to a non-phonetic friend (London); Lote, *Études sur le vers français: l'Alexandrin d'après la phonétique expérimentale* (2nd ed., 3 vols., Paris); Seidel, *Ein phonetisches Alphabet zur Bezeichnung der Aussprache fremder Sprachen* (Berlin, 1914); Tritschler, *Zur Aussprache des Neuhochdeutschen im 18. Jahrhundert* (Freiburg); Metz, *Ein experimentell-phonetischer Beitrag zur Untersuchung der italienischen Konsonantengeminatio* (Bonn, 1914); Streuber, *Die Aussprache und Orthographie im französischen Unterricht in Deutschland während des 16. bis 18. Jahrhunderts* (Berlin); and Julia, *El Castellano puede escribirse como se habla* (Barcelona), a project for the reform of Spanish orthography.

PHILOSOPHY. PHILOSOPHY AND THE WAR. The great war has not been without effect upon the fortunes of philosophy during the past year. The number of books published in the leading countries, both belligerent and neutral, has fallen off, and the philosophical periodicals coming from the battling nations are often late and generally contain a smaller number of pages than heretofore. A pathetic feature is furnished by some of the German journals in the death-lists of German teachers and writers who have died on the field of battle: many a promising young thinker has given his life as a sacrifice to the cause of his country. There is a plethora of books and articles upon the philosophy of this war and upon war in general, as well as upon subjects to which the fateful struggle has given a new interest. In his little volume, *Die Ethik und der Krieg*, Prof. O. Külpe sets himself the task of studying the ethical aspects of war as such in a purely scientific manner and reaches conclusions with which his own country's conduct in the present conflict can be easily squared. Prof. H. Cohen, the veteran leader of the idealistic Marburg school, writes on the uniqueness of the German spirit (*Die Eigentümlichkeit des deutschen Geistes*), and E. Bergmann on the historical mission of German education (*Die weltgeschichtliche Mission der deutschen Bildung*) and Fichte the educator to Germanism (*Fichte*

der Erzieher zum Deutschtum). All these works are examples of the patriotic spirit which is animating European scholars of to-day, and have the true Fichtean ring. At the same time they show that it is impossible in times of stress, even for men thoroughly trained in scientific methods, to preserve the impartial attitude of mind which has always constituted the glory of the scholar in times of peace. The same remarks apply, though in less degree, to the book of the venerable Leipzig philosopher Wilhelm Wundt, *Die Nationen und ihre Philosophie: Ein Kapitel zum Weltkrieg*, in which the superiority of his country's philosophy over the world-views of France and England is set forth, and German idealism declared to be "the philosophy which has proved its trustworthiness throughout all the vicissitudes in the fortunes of individuals as well as of peoples, and has stood the test even in the present war."

It is not surprising that French and English thinkers should likewise find philosophical justification for their cause. In his presidential address before the French Academy of Sciences and Morals, Henri Bergson discusses *The Meaning of War* (translated by Carr) and interprets it, in accordance with his principles, as a conflict between life and matter, Germany being matter. Delbos reaches conclusions in his *L'esprit philosophique de l'Allemagne et la pensée française* which are not in harmony with those of the Germans. Among the interesting contributions to this field made by Englishmen, we mention *The International Crisis in Its Ethical and Psychical Aspects*, by E. M. Sidgwick, G. Murray, A. C. Bradley, Stout, Jacks, and B. Bosanquet; and *Germany in the Nineteenth Century*, a series of lectures delivered at the University of Manchester by a number of English scholars. Since these lectures were given before the war and for the purpose of promoting international good will, they are juster in their estimates of German culture than those written after the outbreak of the conflict. Professor Bosanquet contributes the article on philosophy in the second series. The lack of agreement in the views of the intellectual leaders of Europe is clearly brought to light in the numbers of the Italian Journal *Scientia* (beginning with January, 1915) in which "the most eminent philosophers, historians, sociologists, economists, and jurists," chosen from the opposing camps and also from neutral countries, discuss the various angles of the war. Among the contributors are Lévy-Bruhl, Ashley, Wundt, Landry, Lodge, Von Below, Pareti, W. J. Collins, E. Meyer, and Chatterton-Hill. Two good American books are Prof. Felix Adler's *The World-Crisis and Its Meaning*, and Prof. John Dewey's *German Philosophy and Politics*. Professor Adler offers a thoughtful and impartial inquiry into the deeper causes not only of the present catastrophe, but of the social and ethical shortcomings of our entire modern civilization, and finds them in our false conceptions of life. While Professor Wundt regards utilitarianism and pragmatism (in which the good is identified with the practical) as the typical expression of the British mind, and responsible for England's inability to appreciate higher ideals, Professor Dewey discovers in German idealism with its absolutism and apriorism the germs of the prevalent German theories of politics with their attendant militarism. It will be of interest to readers of Dewey to consult an in-

structive article by Katzer, "Kant und der Krieg" in the *Kant-Studien*, vol xx, 2. A thorough study of war from the evolutionistic point of view is made by W. Mackenzie in his *Significato bio-filosofico della guerra*. A good review of this work has appeared in the July number of the *Révue philosophique*. Many interesting articles on the subjects uppermost in the public mind are to be found in the *Hibbert Journal* and in the *International Journal of Ethics*. Professor Tufts gave as his presidential address before the American Philosophical Association (December, 1914) a paper on the "Ethics of States" which has been published in the March number of the *Philosophical Review*.

LOGIC AND THEORY OF KNOWLEDGE. In spite of the war, however, the work of philosophy is proceeding along the lines described in recent volumes of the YEAR BOOK. The patriotic thinker retiring to his workshop busies himself with the same problems which claimed his attention before the fighting began, and employs the same methods by which he sought to solve them in the past. The theory of knowledge is still the most thoroughly studied field of investigation in Germany. The German mind does not take kindly to positivism, pragmatism, intuitionism, or any of the anti-intellectualistic movements which go against logic. The Marburg school, with Cohen at its head, is teaching its objective idealism which is based on Kant, while Husserl, also a neo-Kantian, with his large following among the younger men, is developing his "phenomenological epistemology," which is seeking to establish a theory of knowledge which shall be free from all presuppositions and shall serve as the *prima philosophia* for all other critiques of reason. Both these schools are arrayed against what they call psychologism in logic, while Nelson, the reviver of Fries, is taking up the cudgels for psychology as an essential aid to the study of logic. These discussions are making it necessary to consider more carefully the relation of psychology to logic, with the result that less extreme views are beginning to prevail, and a sounder philosophical basis is being sought for psychology than has been found by the experimental psychologists. (See Honigswald, *Prinzipien der Denkphilosophie*.) For an account of recent tendencies in German philosophy the reader may consult Ewald's paper "German Philosophy in 1913," in the November number of the *Philosophical Review*, 1914. In this connection it must be noted that the German opposition to intellectualism or logicism has received encouragement from foreign sources like Bergsonism, and is gaining some ground. K. Joel in his *Die philosophische Krisis der Gegenwart* characterizes the antithesis as the dualism between life and thought, and insists upon a philosophy that shall reconcile these extremes. The anti-intellectualist movement has a larger following in England, France, and the United States (humanism, intuitionism, pragmatism) than in Germany. In England, however, the attention is centred upon Bertrand Russell who is demanding a scientific reform of philosophy, and his realism is arousing interest in the English-speaking countries. His latest book, *Our Knowledge of the External World and Scientific Method in Philosophy*, has been bitterly attacked by an anonymous reviewer in the *Nation* and lauded as a work to be reckoned with by John Dewey. Columbia University has gone so far as

to bestow a gold medal upon Russell as having made the most important contribution to philosophy within the last five years. As an antidote to the anti-logical tendencies in English and American thought and extreme forms of idealism, the new realism has value, but it is neither new nor is it the final word on the subject. (For articles on Russell see *Proceedings of Aristotelian Society*, vol. xv; *Mind*; *Journal of Philosophy*; and Dewey's paper in the *Philosophical Review*, July.)

The year's literature on pragmatism, Bergsonism, and other anti-logical theories, is not large. Höffding's little book on *Modern Philosophers*, which has long been available in a German translation, has at last been translated into English and combined with a translation of his able characterization and criticism into a volume bearing the title *Modern Philosophers and Lectures on Bergson*. Mackintosh's *Problems of Knowledge* is for the most part an exposition and criticism of dualism, agnosticism, idealism, the new realism, intellectualism, and pragmatism. The author himself accepts what he calls critical monism as a substitute for an exaggerated absolutism, which he thinks is characteristic of recent philosophical systems. Other books in this field are: Driscoll, *Pragmatism and the Problem of the Idea*; Tuckwell, *Religion and Reality* (a criticism of non-absolutist systems with a view to establishing absolutism on a strictly rational basis). See also *Proceedings of Aristotelian Society*, vol. xv.

Other books on logic are: H. Sturt, *The Principles of Understanding* (humanistic standpoint); Philip, *Essays Toward a Theory of Knowledge*; Walter, *Subject and Object*; More, *The Limitations of Science*; Boutroux, *Certitude et vérité*; Goldschmidt, *Handbuch der voraussetzungslosen Fundamentalwissenschaft*; Meinong, *Ueber Möglichkeit und Wahrscheinlichkeit*; Rickert, *Die Lehre von der Definition* (2nd ed.); De Michelis, *Il problema delle scienze storiche* (criticism of Rickert); Calderon, *Le logicisme*; Stefanescu, *Le dualisme logique*; Liebert, *Problem der Geltung* (an able book on the problem of value); works on Space and Time by Robb, Witte, Henry, Zino-Zini.

METAPHYSICS. The veteran English statesman and member of the Cabinet, Balfour, has found it possible in times like these to publish the substance of his Gifford lectures on *Theism and Humanism*, delivered at Glasgow University before the war. Mr. Balfour disavows any intention of providing a philosophical system. He assumes the common-sense outlook upon life and the whole body of the sciences, and holds that the whole human race, including the philosopher himself, lives by faith alone. And assuming the common beliefs in science, ethics, aesthetics, we are, he thinks, led to theism: all we think best in human culture, whether associated with beauty, goodness, or knowledge, requires God for its support. We have here a causal argument for the existence of God which makes human values its starting point: our values cannot be held or explained unless they have an eternal source. "That is, if we would maintain the value of our highest beliefs and emotions, we must find for them a congruous origin. Beauty must be more than an accident. The source of morality must be moral. The source of knowledge must be rational. If this be granted, you rule out Mechanism; you rule out Naturalism;

you rule out Agnosticism; and a lofty form of Theism becomes, I think, inevitable." In J. M. Baldwin's *Genetic Theory of Reality*, which reminds us somewhat of one of the phases of Schelling's philosophy, we reach the metaphysical culmination of the author's studies in genetic logic, which have appeared in three volumes under the title: *Genetic Logic: Thoughts and Things*. In this fourth volume Professor Baldwin tries to show how genetic logic leads to an æsthetic theory of reality which he calls Pancelism; indeed, genetic thinking itself springs from æsthetic tendencies. Professor Ward has published the fourth edition of his *Naturalism and Agnosticism*, a thorough study and keen criticism of naturalistic theories. Wundt's *Sinnliche und übersinnliche Welt* expresses in a more popular and general form the idealistic world-view long ago set forth in his *System der Philosophie*. In his *Cosmic Relations* (2 vols.) H. Holt presents us with a pantheistic and teleological metaphysics which finds support in the results of psychic research. Other books of interest here are: Ladd, *What Should I Believe? and What May I Hope?*; Hagemann, *Metaphysik*; F. Köhler, *Kulturwege und Erkenntniswege* (2 vols., a critical survey of the problems of the religious and spiritual life); *Festschrift*, dedicated to A. Riehl; Becher, *Naturphilosophie und Weltgebäude, Weltgesetze, Weltentwicklung*; Bavink, *Allgemeine Ergebnisse und Probleme der Naturwissenschaft*; Derwenen, *Naturphilosophie*; Marconi, *Histoire de l'involution naturelle*, translated from the Italian; Stange, *Aristoteles und moderne Weltanschauung*.

ETHICS. Theory and History of Ethics. Ladd, *What Ought I to Do?*; de Laguna, *Introduction to the Science of Ethics*; Mackenzie, *Manual of Ethics* (4th ed.); Hastings, *Encyclopedia of Religion and Ethics* (vol. vii); Liebert, *Das Problem der Geltung*; Nelson, *Ethische Methodenlehre*; Oppenheimer, *The Rationale of Punishment*; Spiller, *The Meaning of Marriage*; Vesper, *Anticipation d'une morale du risque*; Moore, *A Historical Introduction to Ethics*; Tattvabushnan, *Krishna and Gita*; McCabe, *The Sources of the Morality of the Gospels*; Sertillanges, *La morale de St. Thomas d'Aquin*; Shearer, *Hume's Place in Ethics*.

Social, Legal, and Political Ethics. Many important articles in the *International Journal of Ethics*; Adler, *The World Crisis and Its Meaning*; Ames, *Higher Individualism*; P. E. Moore, *Aristocracy and Justice*; *Preliminary Report on Efficiency in the Administration of Justice*; W. H. Taft, *Ethics in Service*; McCall, *The Liberty of Citizenship*; Parker, *Biology and Social Problems*; Shaeffer, *The Social Legislation of the Primitive Semites*; Watkins, *Welfare as an Economic Quantity*; Gide and Rist, *History of Economic Doctrines* (trans.); Fries, *Philosophische Rechtslehre* (reprint); del Vecchio, *The Formal Basis of Law and Die Idee einer vergleichenden universalen Rechtswissenschaft* (both trans.); Löwenstein, *Der Rechtsbegriff als Relationsbegriff*; Maitland and Montague, *Sketch of English Legal History*; Wielkowski, *Neukantianer in der Rechtsphilosophie*; C. D. Burns, *Political Ideals*; Barker, *Political Thought of To-day*; J. A. Hobson, *Towards International Government*; Ford, *Natural History of the State*; Bonucci, *Il fino dello stato*. Other works of interest to students of ethics: Keith, *Antiquity of Man*; H. F. Osborn, *Men of the Old Stone*

Age; Lucka, *Eros: Development of the Sex Relation through the Ages* (trans.); Huntington, *Civilization and Climate*.

HISTORY OF PHILOSOPHY. Completely revised editions of the different parts of the well-known *Grundriss der Geschichte der Philosophie*, by Ueberweg (formerly edited by Heinze), are now being published under the editorship of Frischeisen-Köhler. This work, with its excellent bibliographies, is the result of the coöperation of many specialists, and is a useful aid to students of the history of philosophy. Other new books of general interest are: G. Murray, *The Stoics*; H. O. Taylor, *Deliverance: The Freeing of the Spirit in the Ancient World*; Deussen, *Geschichte der mittelalterlichen Philosophie*; McGiffert, *Rise of Modern Religious Ideas*; J. W. Riley, *American Thought: From Puritanism to Pragmatism*; Höfding, *Modern Philosophers and Lectures on Bergson*; Carus, *Goethe*; Halévy, *Life of F. Nietzsche* (trans.). We mention also: Webb, *A History of Philosophy* (Home University Library Series); Benn, *The Greek Philosophers*, 2nd ed.; Herbertz, *Das Wahrheitsproblem in der griechischen Philosophie*; Jacobus, *Plato and the Sensualism*; Richards, *Aristotelica*; Chevalier, *La notion du nécessaire dans Aristote*; Krakowski, *Les sources médiévales de la philosophie de Locke*; Gentile, *Studi Vichiani*; Cushing, *Baron d'Holbach*; Brunswig, *Grundproblem Kant's*; Stefanescu, *Le dualisme et le théisme de Kant*; the fourth "Year Book of the Schopenhauer Society"; Andler, *Nietzsche, sa vie et sa pensée*; Levenstein, *Nietzsche im Urteil der Arbeiterklasse*; Henning, *Mach als Philosoph, Physiker und Psycholog*.

TRANSLATIONS, NEW EDITIONS OF WORKS, ETC. Works of Aristotle, translated under editorship of W. D. Ross (*Magna moralia*; *Ethica Eudemia*; *De virtutibus et vitiis*; *De mundo*; *De spiritu*); Levi Ben Gerson, *Die Kämpfer Gottes* (trans.); Pascal's complete works, edited with introduction and notes by Brunschwig; selections from the *Scottish Philosophy of Common-Sense*, edited by G. A. Johnaton; Kant's works, vols. v and vi, edited by E. Cassirer; Kant, *Worin besteht das Fortschreiten zum Besseren im Menschengeschlecht?* (hitherto unpublished and unknown), edited by Kullmann; Fichte, *Ideen über Gott und Unsterblichkeit* (an essay hitherto not generally known, discovered and published independently by E. Bergmann and F. Büchsel); Schopenhauer, *The Basis of Morality*, trans. by Bullock (new ed.).

PHILPOTTS, EDEN. See LITERATURE, ENGLISH AND AMERICAN, *Fiction*.

PHONETICS. See PHILOLOGY, MODERN.

PHONOPTICON. A device—consisting of a telephone, voltaic cell, and two or more crystals of some substance whose electrical resistance varies with the intensity of luminous radiation received by it—for conveying to blind persons the sensation of white and black in such a manner as to enable them to read type. In 1914, Fournier d'Albe had described an arrangement of this kind before the Royal Society of London. He gave it the name optophone, a device in which a circuit consisting of a battery, a selenium cell, and a telephone were successful in enabling the blind to distinguish light from darkness. An improvement upon this was made in 1915 by F. C. Brown, of Iowa State University, which differed from d'Albe's arrangement in having a number of specially prepared crystals of sele-

nium. It was used by moving it over a printed page when strongly illuminated. This apparatus was considered quite satisfactory in enabling the blind to read type with but little instruction in its use. The person employing it was able to perceive a type letter by the change of intensity of the sound emitted by the telephone receiver. The shape of the letter, and so its identity, was learned by familiarizing one's self with the character and rate of change of the sound.

PHOSPHATES. See FERTILIZERS.

PHOTOGRAPHY. Among the general advances in photography to be noted during the year 1915 were many improvements made in cinematograph cameras, particularly in the portable types for the use of tourists and explorers. There was also progress in motion picture studio work, and the gas-filled tungsten lamp that had been found satisfactory as an illuminant during the previous year was employed much more extensively, in some instances entirely replacing the mercury vapor lamps. Reports from European studios corroborated the results secured in the United States. The gas-filled lamp was found to give the best photographic results when operated at a voltage 25 per cent higher than that for which it was made. While such treatment shortens the life of an incandescent lamp it improves its usefulness by increasing its range of actinic radiation. In one case a lamp operated at 25 per cent over voltage gave 100 per cent increase in brightness, thus shortening the time necessary for exposure. As a substitute for magnesium flash light, it was widely used for photographing interiors. Even when used for daylight exposures, it was found that many corners and dark areas of an apartment would be illuminated by these lamps so that operators were enabled to secure more satisfactory pictures. Naturally a longer exposure was required than when flash light powder was employed, and with the 200-watt gas-filled lamps an exposure of from two to four minutes with an F-8 stop was found necessary.

In color photography, Frederick E. Ives invented a process that marked a distinct advance in the art, making it possible to print directly from the negatives on paper so that the colors would appear in their proper values. He used a camera containing three plates sensitized to red, green, and blue, respectively. The blue plate was laid on the bottom of the camera and light traversing the lens was reflected to it by a plate of amber tinted glass inclined at an angle of 45°. The filtered rays transmitted by this glass then reached the other plates which were placed with their sensitized faces in contact. Tank development for all three plates was used. When fixed, the blue negative was printed on a suitably sensitized paper, while the red and green negatives were printed on transparent films treated with potassium bichromate and then baked in sodium hyposulphite. Finally, when the two films thus secured from the red and green exposures were laid over the blue print and properly registered, any number of paper prints could be made.

An ingenious camera was brought out for the purpose of making a photographic record of an electric or gas meter. The camera contained four small incandescent lamps supplied by a battery. To take a reading, the case carrying the combined camera and battery was placed in front of the meter and the action of a small lever at

the side of the case exposed the film. The negative when developed showed the readings in reverse order, but when placed in a special holder provided with a mirror the figures could be seen in their correct position. The advantage of this device to the electric service companies was that it automatically furnished a photographic record of every meter read by its meter men, thus avoiding errors either in reading or transferring the figures.

Progress was reported in the construction and arrangement of lens combinations for telephotographic work and an improved form of this kind of camera was widely used by the allied armies for scouting purposes.

Before the European war, almost all photographic print paper used in the United States was imported from foreign countries. As the great conflict almost entirely shut off this supply, American manufacturers were giving closer attention than ever before to the production of a suitable paper for this purpose, and it was reported that several mills were producing papers highly satisfactory on account of their freedom from substances that would give rise to spots and stains when put in the developing and fixing solutions, a common objection to the use of domestic papers formerly manufactured.

A process was brought out during the year by which it was possible to sensitize delicate hand-made Japanese tissue paper so as to make it available for contact printing and enlargement by artificial light. Hitherto the delicate structure of such papers made it impossible to apply the sensitizing emulsions in ordinary use. The inventor of the process succeeded in treating this tissue with baryta and the sensitizing emulsions in such a manner as to render the paper strong enough to withstand manipulation during developing, fixing, and washing. The paper so prepared could be dried between sheets of blotting paper in 20 minutes, remaining flat and flexible, while retaining the smooth surface characteristic of Japanese tissues. Prints made on such paper gave beautiful results, and were found adaptable to various methods of coloring.

In the United States District Court on Aug. 24, 1915, a decision was handed down adverse to the Eastman Kodak Company in the suit of the United States government under the Sherman Anti-Trust Law. The company had made various attempts to effect a settlement with the Department of Justice, but without success. One portion of the government's complaint related to the methods of doing business, including fixing of retail prices for the company's goods. Some modifications of this practice were suggested, but were not acceptable to the government. The order embodied in the decision required the separation of the business of the Eastman Kodak Company into two or more separate companies; but this change was not to be construed as being immediately necessary. It was still hoped that some reorganization of the constituent companies could be brought about so as satisfactorily to meet the requirements of the decision. The original bill against the Eastman Company was filed on June 9, 1913. One detail of interest not only to the makers and users of photographic materials but to all manufacturers as well, was the statement by Judge Hazell that the decision was based upon the fact that the acts of the corporation had been contrary to law, and not merely because of its size.

That part of the complaint relating to contracts between the defendants and the Motion Picture Patents Company was dismissed.

PHOTOMETRY. See **ASTRONOMY.**

PHOTOPLAYS. During 1915, as in the previous year, the production of photoplays increased enormously and many theatres formerly used for the spoken drama were offering only screen plays. The high salaries that had drawn so many actors and actresses into this kind of work continued to attract them, as well as to bring out many new stars having special qualifications for acting before the camera. Besides the immense number of new offerings of photoplays, a great many adaptations of books and dramas that had been successful in the past were modified or re-written for presentation as photoplays. It would be impossible herein to record the names or to give an outline of even the most successful ones, however. Their production was stimulated by the great financial success that had attended like undertakings in the previous year due to the constantly growing popularity of cinema exhibitions in general. The cost of producing many of these adaptations was very large, and they were usually exhibited only in the class of theatres customarily asking higher prices of admission than the ordinary film houses. An enormous number of photoplays that were ordinary third-rate melodrama were also brought out, and for this kind of entertainment the public appetite seemed to be more eager than ever. From a photographic and technical point of view films were better, the objectionable flicker and irregular illumination that formerly characterized many of them having been almost entirely absent. There was a growing opinion among serious observers, however, that the average cinema drama had too frequent a tendency to employ sex problems, the human triangle, etc., for its appeal, and was too coarse and raw in its treatment of subjects considered delicate by those of refined sensibilities to hold any degree of permanent popularity. There were many notable exceptions to this statement, for example, the *Birth of a Nation*, referred to in the 1914 YEAR BOOK. Its success was so great that its presentation was continued throughout the year, and in spite of the fact that it was exhibited in one of the highest priced theatres. When the question of preparedness for national defense became prominent the *Battle Cry of Peace*, by J. Stuart Blackton, was produced, and for a time attracted some attention. It was well constructed, and the greatest possible use was made of the defenseless condition of the United States against invasion by an enemy. In the latter part of the year Mark Twain's *Prince and Pauper* was presented, as well as a version of *The Old Homestead* that had been made famous some years before by Denman Thompson. Another attempt at dramatization was a filmed version of *Don Quixote*, in which, as well as in the others mentioned, there were many points of departure from the original, most of which added nothing to the intrinsic value of the story as a means of entertainment. As evidence of the willingness of the producing companies to provide clean, attractive cinema plays may be mentioned a contract made by one of these concerns with Ethel Barrymore for a consideration that amounted to \$160,000 a year for a term of three years. Other engagements with equally well-known stars were entered into

at proportionately high rates of remuneration. The demand for bright, original themes was greater than ever and thousands of persons were engaged in writing scenarios, many of them vainly imagining that their work would be accepted and an easy road to fame opened to them.

For the purpose of maintaining the interest of the public as well as to add variety that could not be secured without words, important alterations were made in the action of the books and plays worked over for the films as well as in the treatment of their themes. Not the least difficult of these undertakings was the filming of the action of several operas, including *Carmen* and *Madame Butterfly*. Cost of production was disregarded and the services of the original operatic stars were secured for the filmed operas. It is doubtful, however, how long the hold of such productions upon the public can be maintained, since the appeal of a filmed opera rests absolutely upon its obvious situations alone. For this reason many of the works shown during the past year can hardly expect more than a short life because they lack this kind of appealing quality. Producers were realizing that the construction of a successful cinema play demands different treatment from that of the spoken drama and showed their enlightenment on this matter in many of their recent adaptations and reconstructions.

The work of the National Board of Censors was continued with fairly satisfactory results. The need of a uniform system of censoring plays offered for screen exhibition was still a pressing one, and in several States the commissions appointed for this purpose were passing upon the merits of an enormous amount of product from the studios. These State commissions, however, did not always work in harmony, and the need of a National or Federal Board was again emphasized and considerable agitation carried on with a view to securing legislation for the creation of such a body.

Competition among the companies producing motion pictures of all kinds was very keen, and at the close of the year the Imperial Film Exchange had begun a suit in the Federal District Court under the Sherman Anti-Trust Law for treble damages, amounting to \$750,000, against the General Film Company, the Vitagraph Company of America, Pathé Frères, Kalem Company, Edison Manufacturing Company, Biograph Company, Essanay Film Manufacturing Company, Lubin, Selig Polyscope Company, George Kleine, and the Motion Picture Patents Company. The complainant in this case alleged that the General Film Company was organized by the other defendants as a moving picture exchange and in doing so "entered into a conspiracy to monopolize and control the sale and distribution in the various States and Territories." It was further alleged that these defendants entered into various agreements fixing arbitrary prices at which photoplay films were to be rented to exhibitors throughout the United States, in defiance of the Sherman Law.

While the photoplay was increasing in popularity, and in certain directions apparently replacing the spoken drama, it was the opinion of those best informed that there was a characteristic sphere for each one of these forms of entertainment. While many theatrical producers had turned over their houses to the photoplays, others again were going ahead with regular dra-

matic productions on a large scale without fear of competition in the particular kind of plays which they intended to present. Each kind of entertainment has to a large extent its own appreciative public. Thousands demand and will continue to demand good plays, well acted, and correctly spoken. Millions demand photoplays who will not make any effort to understand more than what they can see on the screen.

PHYFE, WILLIAM HENRY PINKNEY. American writer and orthologian, died March 7, 1915. He was born in New York City in 1855. He was educated by private tutors and at Columbia University. He was the author of many books on correct spelling and pronunciation. The best known of these are: *7000 Words Often Mispronounced*; *5000 Words Often Misspelled*; *5000 Facts and Fancies*, a small encyclopædia; *12,000 Words Often Mispronounced*; *Napoleon—The Return from St. Helena* (1907).

PHYSICS. It will be remembered that the work in physics for 1913 was characterized particularly by the investigations on X-rays and crystals. This led in 1914 to the consideration of the theories of atomic structure. The trend of the year 1915 is largely an outgrowth of this in that much attention has been devoted to testing these theories by the criteria furnished by the spectra of various elements—especially hydrogen and helium.

In addition to this work on series spectra and their relation to atomic structures, there has been much discussion of the theories dealing with the conduction of heat and electricity in metals and with the optical properties of metals. The general lines of work mentioned in past years have received due attention. But more than one promising research has been interrupted by "departure for the seat of war."

It is trite to comment on the fact that the present European war has called upon every department of scientific study to give technical assistance in the art of wholesale destruction. At the same time some of the contributions of physics possess an interest entirely aside from their murderous efficiency. It is true that the author of one of the standard English textbooks on optics has published an article in *Nature* on "Aiming with the Rifle," in which a discussion of the optical principles involved is followed by practical suggestions to the prospective marksman. But this is offset by another article in the same journal describing a device for protecting the ears against the concussion of artillery fire and bursting shells. This cuts off the shock of the intense noise without interfering appreciably with the ability to hear sounds of ordinary intensity. Moreover, the fact that modern artillery shells travel with a velocity greater than that of sound has led to some very interesting observations on the repeated sounds to which such shells may give rise.

The demands of the field hospital for rapid and accurate means for locating projectiles have led to several lines of development. In the case of iron or steel missiles powerful electromagnets are of service. The surgeon has long acknowledged his indebtedness to the X-ray bulb and the fluoroscope, but now he is demanding more than merely a shadow picture. At least three or four different methods for locating the exact position of a projectile in the human body have been devised. Most of these are applications of familiar principles in geometric optics. Over

40 papers dealing with such problems have appeared in the *Comptes Rendus* during 1915.

SERIES SPECTRA AND THE STRUCTURE OF THE ATOM. As already mentioned, much attention has been devoted of late to testing the relative merits of rival atomic theories by evidence presented in the series of lines in the spectra of the elements. Since the hydrogen and helium atoms have the simplest structure, much of the work has centred about them. Much of the theory is of a highly mathematical nature, and no brief review of the arguments by which the conclusions are reached is possible in such an article as this. Also, in some instances, the results themselves are most easily stated in mathematical language. All that will be attempted at this time is a brief mention of the recent experimental work and an outline of the important theoretical discussions. To assist the reader in following this, the next two or three paragraphs are devoted to a review of the accepted laws of series spectra.

The orderly arrangement of the lines which compose such a spectrum as that of hydrogen was noticed early in the study of spectroscopy. The first attempts to discover a relation between the frequencies of these lines were based on analogies with the musical scale. Such attempts were far from successful, and showed that the phenomena involved are very complicated. No real progress was made until Balmer showed (1885) that the frequencies of the prominent lines in the hydrogen spectrum can be calculated by means of the formula

$$\frac{1}{\lambda} = 27418.75 (1 - 4/m^2)$$

by giving m the values 3, 4, 5, 6, etc. The hydrogen spectrum includes many lines which are not given by the Balmer formula, and not all of the lines which can be calculated by it have been recognized. Nevertheless, Balmer's suggestion has been of great assistance, and many attempts made to deduce a similar relation of more universal application.

As is well known, such formulæ have been proposed by Kayser and Runge, Hicks, Ritz, Rydberg, and others. The one proposed by Rydberg has some advantages. It may be written in the form

$$n = A - \frac{No}{(m + \mu)^2}$$

where n denotes the frequency, i.e. the number of wave lengths per cm. (in a vacuum), A and μ are constants which depend upon the particular element involved, and No is a *universal* constant for *all* elements. The frequencies of the different lines in the series are obtained by giving m the values 1, 2, 3, —. In applying this formula it was soon found that, as a rule, the spectrum of an element consisted of three series each of which could be represented by such an equation. These are generally distinguished as the principal and the first and second subordinate series.

It is readily seen from the equation that as m increases the value of n approaches the value A as its limit. For this reason A is called the *convergence frequency* of the series. The two subordinate series have the *same* convergence frequency. The lowest value of the frequency for a given series is obtained by placing $m = 1$ in the formula. This is called the *fundamental*

frequency of the series. A number of years ago Rydberg and Schuster independently arrived at the conclusion that the *convergence frequency of the principal series is equal to the sum of the convergence frequency of the subordinate series and the fundamental frequency of the principal series*. That is, the convergence frequency of the subordinate series must be

$$A' = \frac{No}{(1 + \mu)^2}$$

Hence, when we have once determined the principal series, we are in a position to make certain predictions concerning the subordinate series, and vice versa. This relation also gives added significance to Rydberg's constant.

With this outline of the relations between spectral series in mind, the bearing of such phenomena on the theories of atomic structure are readily seen. Any theory of atomic structure must provide some mechanism for sending out vibrations differing in frequency according to the laws of series spectra, as well as meeting the complex requirements of radio-active and X-ray theory. See 1914 YEAR BOOK.

The recent experimental work along this line is not very great in amount when compared to the number of papers dealing with the theoretical side of the question. Most of the experimental investigations have been undertaken to furnish some link in the evidence required by a particular theory. For example, there has been considerable controversy over the origin of the line whose wave length is $4686 \text{ \AA}^{\circ}\text{U}$. Accordingly, Evans made an investigation of this point. He found this line in the spectrum of a discharge tube containing helium without a trace of hydrogen. A similar result was obtained independently by Stark. Fowler, too, failed to find this line in the spectrum of a hydrogen tube in the absence of helium. According to Bohr's theory (mentioned in the YEAR BOOK for 1914) this line of wave length $4686 \text{ \AA}^{\circ}\text{U}$. belongs to the spectrum of helium. On this basis, the lines known as the "3203 series" can be united with the lines of the "4686 series" to form a single series for which the constant is $4No$ instead of No . This series, according to Bohr, is produced during the binding of an electron by a helium atom from which two electrons have been removed by the exciting source. This use of $4No$ instead of the usual Rydberg constant had been suggested by Fowler in 1914 to explain the series in the helium spectrum.

On the other hand, Merton points to the fact that the members of the Balmer series of the hydrogen spectrum lying in the ultra-violet have not been observed in spectra from tubes containing pure hydrogen. Hence he holds that the spectroscopic evidence that the "4686 line" belongs to helium, though strong, is not conclusive. He attacked the problem of its origin by determining the highest order of interference of the spectrum lines at which "fringes" produced by the method of Fabry and Perot remain visible. Lord Rayleigh has shown that this limiting order of interference, N , for visible fringes is given by the equation

$$N = K \sqrt{M/T}$$

where K is a constant, M is the atomic weight of the source of the line and T is the absolute temperature. As a result of his experiments Merton states that "the mass of the atom from

which 4686 originates is definitely smaller than that of the atoms concerned in the production of the ordinary helium spectrum." This certainly leaves much room for future investigation.

Bohr's theory of the origin of Spectra included the prediction of certain very faint lines in the spectrum of helium, and it was claimed that the existence or non-existence of these lines would prove or disprove the theory. These lines were found by Evans in the course of the investigation mentioned above. Nicholson at once pointed out that these lines could not be used as a final test of the truth of Bohr's theory, since their existence follows at once from that of the "4686 series" whatever its interpretation. According to his argument, the test of the theory can only be made by means of very accurate interference measurements.

Nicholson has proposed a "generalized Rydberg formula" involving the constant $4N_0$ and substituting for the term $(m + \mu)^2$ in the denominator, a much more complicated function of $(m + \mu)$. It is hard to see what is the physical meaning of such a complex formula.

Late in 1915 Bohr published a rather long paper (*Phil. Mag.*, vol. xxx, pp. 394-415, Sept., 1915) giving a somewhat modified form of his theory. While we may say that his general method is to apply Planck's quantum theory to the Rutherford atom, to get any adequate idea of this contribution it is necessary to study the original paper.

Allen has proposed a modification of Bohr's theory by adding the assumption that the core of the atom has a magnetic as well as an electric field. To quote from one of Allen's later papers: "The atomic model which is suggested . . . consists of a ring or rings of electrons surrounding a central core, having a radius considerably greater than the nucleus of the Rutherford atom and in consequence capable of producing appreciable magnetic forces in its vicinity. The total charge of the core must be equal to N_e where N is the atomic number. The magnetic moment of the core arises from the orbital motion of the discrete electrified particles (α particles, β particles, hydrogen nuclei, or positive electrons) of which it is composed. . . . A consideration of the laws of spectral series suggests that the quantity μ , the 'phase' of the series, is connected with the angular momentum of the particular part of the core specially associated with the external electron concerned in radiation. A further study of the values of this quantity may lead to a more complete knowledge of the structure of the core" (*Phil. Mag.*, vol. xxix, p. 724, May, 1915).

Hicks has worked out a theory somewhat similar to Allen's, but his results cannot be directly applied unless the central mass is large compared to a hydrogen atom. W. Wilson has contributed a theory of radiation which "contains that of Planck (in one of its forms) as a special case and, while formally distinct from Bohr's theory, leads to the same results when applied to the Rutherford type of atom."

In a series of papers appearing in the *Philosophical Magazine*, A. C. Crehore has developed a very elaborate theory of atomic constitution based upon the mechanics of revolving particles. Moreover, he has investigated in great detail not only the conditions under which the atom itself shall form a stable system, but also those which are required by the formation of compound mole-

cules and crystals. His models for rock salt and diamond are in general agreement both qualitatively and quantitatively with Bragg's results. The amount of calculation necessary in working out so elaborate a theory is appalling, and it is surprising that Crehore has been able to make such rapid progress.

The above résumé gives only the most prominent features of the discussion on atomic structure. To gain an adequate conception of it one must consult the files of the leading journals, especially the *Philosophical Magazine*, and the *Proceedings of the Royal Society*. An excellent review of one phase of the matter is given in an article by Fulcher on "The Stark Effect and Atomic Structure" (*Astrophysical Journal*, vol. xli, pp. 359-372, June, 1915).

For many years Lyman has been investigating the extreme ultra-violet. Work in this region is particularly difficult, due to the fact that these exceedingly short waves are absorbed very readily even by gases at low pressure. This has necessitated the perfecting of a vacuum grating spectrometer. During the past year Lyman has succeeded in studying the spectrum down to wave-lengths of about 600 Å.U.—that is approximately through the third octave beyond the visible. He has found 15 lines in the spectrum of helium lying between 1250 Å.U. and 600 Å.U., and in the hydrogen spectrum he has identified the series 1216 Å.U., 1026 Å.U., and 972 Å.U., which was predicted by Ritz.

McLennan and Dearle have studied the other end of the invisible spectrum. Using a mercury arc in a quartz tube as their source, they studied the region from 10,000 Å.U. (1.00 μ) to 30,200 Å.U. (3.02 μ). Of course, the infra-red spectrum has been carried to wave lengths over 100 times this limit (see 1911 YEAR BOOK). But McLennan and Dearle found three new lines in this interval—10,670 Å.U., 10,900 Å.U., and 12,700 Å.U.—and confirmed the measured wave lengths of the other 10 lines which had previously been identified. With the mapping of new series of lines in the infra-red and the ultra-violet regions, new tests for the various theories of radiation are supplied.

Another very interesting contribution to our knowledge of spectra has been made from McLennan's laboratory. In collaboration with Henderson he has succeeded in producing spectra of mercury, cadmium, and zinc, each of which consists of a single line. By applying the quantum theory they computed, from the wave lengths of these lines, the minimum potential difference necessary to ionize zinc and cadmium. The values obtained are 3.74 volts and 3.96 volts, assuming the corresponding value for mercury to be 4.9 volts as shown by Franck and Hertz. The minimum arcing potentials necessary to bring out the many lined spectra of mercury, zinc, and cadmium vapors are, respectively, 12.5 volts, 15.8 volts, and 15.3 volts. J. J. Thomson has suggested that there are two types of ionization of mercury atoms. These results are in line with that theory and suggest that a similar condition exists for cadmium and zinc. That is, the potential differences giving the single line spectra are the minimum ionizing potentials for the first type, while the potential differences necessary for arcing are the minimum ionizing potentials of the second type. These single line spectra may prove to be of great aid in the study of atomic structure.

RESONANCE AND FLUORESCENT SPECTRA. The work of Wood, Dunoyer, and others on the "resonance spectra" in sodium and iodine vapors was described at some length in the YEAR BOOKS for 1911 and 1912. The year 1915 has seen several additions to our knowledge in this field.

In his work on iodine vapor, Wood found that the resonance spectra disappeared when the vapor was heated above 325°C . Moreover, he was unable to detect any resonance when radiation of a wave length shorter than $5460\text{ \AA.U.}$ (the green line of the mercury arc) was used as the exciting source. McLennan has now succeeded in going far beyond both of these limits. By using ultra violet as the exciting "light" he was able to produce fluorescence in iodine vapor at temperatures varying from 20°C . up to at least 1000°C . The wave lengths used to stimulate this fluorescence lie in the region from $2100\text{ \AA.U.}$ to $1800\text{ \AA.U.}$ The fluorescent spectrum produced consists of narrow bands extending from approximately wave length $4800\text{ \AA.U.}$ (blue) to wave length $2100\text{ \AA.U.}$ —the limit of the exciting source. In particular, there are seven prominent equally spaced bands in the interval bounded by the wave lengths $3315\text{ \AA.U.}$ and $3175\text{ \AA.U.}$

Resonance in sodium vapor has been extensively studied by Wood, but we are indebted to Strutt for the recent additions to our knowledge of it. Some of his experiments are similar to those of Wood on mercury vapor and the results are analogous. For example, one of Strutt's papers contains the statement: "Resonance radiation of sodium cannot be seen through even a very dilute layer of sodium vapor placed in front of it—a layer quite transparent to white light." (For analogous effect in mercury vapor, see 1912 YEAR BOOK, p. 532.) He also found that resonance radiation from sodium vapor is changed in intensity when either the vapor or the exciting flame is placed in a magnetic field. The effect observed depends upon the strength of the exciting flame. Strutt has suggested an explanation based upon the theory of the Zeeman effect.

The "resonance radiation" discussed in the preceding paragraph consists of the yellow light of the "D lines." While the "D lines" are the only lines of the sodium spectrum which are visible, it is well known that this spectrum really consists of a series of lines, the other members of which lie in the ultra violet. The next member of this series is a double line of wave length $3303\text{ \AA.U.}$ Wood suggested several years ago that sodium vapor might fluoresce when stimulated by "light" of this wave length. He was, however, unable to observe any such effect. Strutt's work shows that his failure was due to lack of intensity of the exciting "light." He constructed a sodium vapor arc lamp in a quartz tube similar in principle to the familiar quartz mercury vapor lamp. With this as a course he was able to isolate an intense beam of ultra violet of wave length $3303\text{ \AA.U.}$ By means of a quartz lens this was concentrated on a quartz bulb containing sodium. This bulb was heated almost to redness with a Bunsen flame, which was then extinguished. As the bulb cooled and the vapor pressure grew less, a luminous patch appeared which grew larger until it filled the entire bulb, and then gradually faded, disappearing entirely when the bulb was cold. It was found that stimulation by either member of the

double line at $3303\text{ \AA.U.}$ produced a fluorescent spectrum containing both of the "D lines." This result is surprising since Wood and Dunoyer found that stimulation by light from one of the "D lines" produced a resonance spectrum containing only that line (see 1914 YEAR BOOK). In some of his later work Strutt used a vacuum zinc arc as the source of his ultra violet. By using very heavy currents he obtained fluorescence of the same intensity as the light from a "moderately salted Bunsen flame."

THEORETICAL PHYSICS. The year 1915 has produced about the normal number of abstract papers dealing with relativity, theories of gravitation, quantum theory, radiation, etc. It is impossible to give any review of these important contributions.

As already mentioned, theories of metallic conduction and the optical properties of metals have received almost as much attention as the atomic theories. The Lorentz theory of electrical conduction in metals is now almost classic. It is in general accord with the experimental facts throughout a considerable temperature range and furnishes a theoretical basis for the "Wiedemann-Frantz law." The work of Onnes at low temperatures (see 1914 YEAR BOOK, and below) and the renewed study of the Hall effect have helped to emphasize the limitations of this theory and the need for further work along this line. The work of Lorentz has served as a guide to Livens in developing his theory of electrical and thermal conduction. Following Lorentz he assumes that the conductivity of a metal is due to the presence of free electrons which have a mean free path and which may be treated by the kinetic theory of gases. He has developed his theory in great detail, no less than 11 articles from his pen along this line having appeared during 1915 in the *Philosophical Magazine*.

Lindemann has criticised the assumption that free electrons obey the gas law, calling attention to the fact that a gas can conduct heat well only in case its heat capacity is large. Experiment has shown that free electrons conduct heat well and that their heat capacity is too small to be measured. The assumption of a large free path to offset the small number of electrons leads to results which are in conflict with the optical properties of metals. Lindemann's theory contains the suggestion that the free electrons in a metal form a space lattice which at very low temperatures is similar to the space lattice of a crystal. At ordinary temperatures it is altered since the electron must be vibrating at high frequency. While this appears to explain the behavior of alloys, it certainly requires special assumptions to bring it into line with other well recognized facts.

J. J. Thomson bases his criticism of theories such as those of Lorentz and Livens on the phenomena of super-conductivity observed by Onnes. If the free electrons act like a perfect gas, increased conductivity is produced by an increase in the mean free path. But in Onnes's experiments the conductivity was increased over four million million fold. A corresponding increase in the mean free path of the electrons is absurd. To avoid this difficulty, Thomson suggested that the atoms of the metal are joined in pairs, thus forming neutral doublets. These doublets are arranged throughout the metal with their axes pointing in all directions. Even the smallest difference of potential, however, tends

to orient the doublets with their axes in the direction of the applied e.m.f. The electrons then pass directly from atom to atom.

The resemblance between this rearrangement of the doublets and Ewing's theory of magnetism is obvious. The passage of the electrons from doublet to doublet is similar to the accepted view of conduction in electrolytes. Since the thermal agitation of the atoms opposes any alignment of the doublets, we would expect the conductivity to be increased enormously at very low temperatures.

RADIOACTIVITY. Almost since the beginning of our knowledge of radioactive transformations lead has been thought to be the final product in one or more of the radioactive series. In the last number of the *YEAR BOOK* mention was made of the work of Richards and Lambert on the atomic weight of lead of radioactive origin. Recently Soddy has extracted 80 grams of lead from some 20 kilograms of Ceylon thorite. This lead and a similar amount of assay lead were purified by identical processes. Determinations of the specific gravity of the assay lead gave results that checked exactly with the accepted values, but the specific gravity of the lead from thorite proved to be .026 per cent higher. This indicates 207.64 as the atomic weight, assuming that the atomic weight of "ordinary" lead is 207.10. In attempting to account for such phenomena, Lindemann says: "The simplest assumption would appear to be that the nuclei of isotopes differ in their linear dimensions, but not at all, or only very little, in the arrangement of the particles."

Merton has made a very careful comparison of the spectrum of ordinary lead and that of the lead contained in Joachimsthal pitchblende. The principal lines in the two spectra between 3500 $\text{\AA}$.U. and 4100 $\text{\AA}$.U. were found to agree within 0.03 $\text{\AA}$.U.

Direct determinations of the period of transformation of some of the radioactive processes must, from the nature of the case, be made only after years of observation. Some recent work of Soddy and Miss Hitchens illustrates this. In 1905 Soddy prepared a solution of uranium, free from radium and any intermediate products. From time to time the solution has been carefully examined. After 10 years they are able to announce that the growth of radium seems to be proportional to the square of the time. This agrees with the theory that ionium is the only long-lived intermediate product. The period of average life of ionium is given as 100,000 years on the assumption that that of radium is 2375 years.

In 1914 Marsden found that when α particles pass through hydrogen, particles are given off at high velocity. These "hydrogen particles" were supposed to be hydrogen nuclei, just as α particles are helium nuclei. To test whether these are capable of ionizing a gas through which they pass, McLennan and Mercer took photographs of the paths of the α particles, using the method and apparatus of C. T. R. Wilson (see *YEAR BOOKS* for 1911 and 1912). These photographs are very fine, but they show very little evidence of the effect sought. However, they show that the α ray tracks in hydrogen are longer than in air. The results in general confirm the position of Rutherford and C. T. R. Wilson that the scattering of α particles is due to single reflections through considerable angles.

Much important work has been done by Makower, Walmsley, Tunstall, and others in determining various radioactive constants, but their experiments, though very valuable, present no points of special interest.

X-RAYS. In the last few years, Barkla and his associates have studied the effects when a primary beam of X-rays is absorbed by an element. The total energy absorbed from the primary beam is equal to the sum of the energies of the "fluorescent" X-radiation and the corpuscular radiation which are emitted (see *YEAR BOOKS* for 1911, 1912, and 1913). A definite portion of the corpuscular radiation is associated with the fluorescent X-radiation, and the number of quanta of fluorescent X-radiation emitted is equal to the number of high speed electrons emitted in this associated corpuscular radiation.

Early in 1915 Barkla showed that when the wave length of the incident primary beam is just less than that of the "characteristic radiation," the energy is equally divided between the corpuscular and the fluorescent radiation. As the wave length of the primary beam decreases, the proportion of the energy in the corpuscular radiation increases so that for very short wave lengths practically all of it appears there. The absorption by an atom is not necessarily in whole quanta and there is no loss of energy within the atom in transforming primary into fluorescent radiation, at least in the cases for which there are experimental data. In December, 1915, Barkla and Shearer showed that the maximum velocity of ejection of an electron does not depend upon the particular substance from which it is ejected. The "K" and the "L" electrons for a particular substance (see 1914 *YEAR BOOK*), though of different origin, are emitted with approximately the same velocity.

Working along similar lines, Moore has shown that the number of electrons liberated from an atom of carbon, oxygen, nitrogen, sulphur, or chlorine by a given beam of X-rays is the same whether the atom is combined with other atoms or not. From his results and those of Barkla and Simons (1912), and Barkla and Philpot (1913), Moore concludes that the amount of X-radiation absorbed by an atom of a gas is proportional to the fourth power of the atomic weight. Bragg and Pierce have shown that a similar law holds for elements in the solid state. This suggests that the law is of universal application and it should therefore be possible to compute the absorption coefficient of any material "provided its homogeneous (characteristic) radiation is not excited."

Due to their very short wave lengths, diffraction effects at a slit or a straight edge are very difficult to observe with X-rays. An elaborate series of experiments by Laub along these lines has been very successful and he has produced effects analogous to the corresponding well-known effects in light. He has also studied the relation between the intensity of the secondary radiation and the angle of incidence of the primary beam which produces it. The results include new characteristic radiations from iron, copper, zinc, platinum, lead, carbon, and sulphur. These radiations from carbon and sulphur are the hardest characteristic X-radiations yet discovered.

Winawer and St. Sachs have described a method by which X-rays may be compared with the γ radiation from radium. As a result of

their experiments, they propose the following unit for such measurements: "A beam of X-rays will have unit energy if, by its complete absorption in air, it produces the same number of ions as the γ rays from 1 gram of radium (B + C) would produce under similar conditions." Other methods of measuring the intensity of a beam of X-rays are mentioned under SELENIUM.

The Coolidge tube, described in the YEAR BOOK for 1913, has proved of immense assistance in the study of phenomena requiring X-rays of constant wave length and intensity. Almost as soon as it was perfected, Darwin began a comprehensive study of its performance. Like the work of W. L. Bragg on X-rays and crystals, this research was interrupted by the transformation of the scientist into the soldier. Darwin's work has been continued by Rutherford, J. Barnes, and H. Richardson. The behavior of the Coolidge tube was studied at voltages varying from 13,000 to 175,000 volts. The shortest wave length obtained is $0.17 \text{ \AA} \cdot \text{U.}$ —about $\frac{1}{10}$ of one one-billionth of an inch. This is produced at about 145,000 volts. The frequency and penetrating power reach the maximum at this voltage and are unchanged by an increase to 175,000 volts. The quantum theory was found to apply directly to the excitation of the lower frequencies, but at the higher frequencies a correction factor is necessary. The value of this correction term increases rapidly with the frequency. Even at high voltages the absolute efficiency of the tube is not high—about $\frac{1}{2}$ per cent—showing that on the average only about 1 electron in 300 is effective in producing radiation.

During the early months of 1915 X-rays were put to a novel use in assisting the shipment of cotton to Europe. A powerful tube, operating at several kilowatts, was placed on one side of a cotton bale. An observer on the other side examined the bale with a fluoroscope. In this way the presence of any contraband such as copper or rubber could be detected.

SELENIUM. On account of the many factors which affect it, the study of the behavior of selenium is both baffling and attractive. One of the most enthusiastic groups of investigators along this line consists of F. C. Brown and his associates, Sieg and Dietrich.

In 1914 these investigators succeeded in producing selenium crystals so large that the behavior of a single crystal could be studied. In this way the uncertainties due to interaction at the boundaries between crystals are eliminated. The results with these large crystals are most interesting.

The change in resistance produced by illumination takes place throughout the crystal itself—not at the contacts with the rest of the circuit. When a crystal is illuminated at different points, approximately the same effect is produced at all places. The change in resistance of a crystal is approximately the same whether the illumination occurs on the side of the crystal at which the contacts are made or on the opposite side. Since no light goes through the crystal, the conductivity seems to be controlled by sympathetic centres which are located throughout it. The effects of separate illuminations overlap just as if they were produced at the same spot.

While illumination at one point affects the entire crystal, just the opposite effect is observed when mechanical pressure or electric

force is applied. In such cases, only the points of application of the mechanical or electric force are affected. This indicates that the mechanism to which the light-sensitiveness is due is essentially different from that called into play by mechanical or electrical stresses.

The influence of annealing on the properties of a selenium cell were recognized early in the study of its behavior. This was investigated in a detailed and systematic manner, together with the sensitiveness to light of different wave lengths. The shape of the wave-length-sensibility curve was shown to be dependent upon the temperature of annealing. This can be explained by assuming the presence of various kinds of crystals, or different positions of the same kind of crystal; for the temperature favorable to the production of one kind or configuration might be very unfavorable for another.

An attempt to detect a difference between the thermal conductivity of a selenium crystal in light and in darkness gave negative results. Other experiments showed that the transmitted light action has a velocity of not less than 2 cm. per second. Hence it cannot be a temperature disturbance.

In attempting to develop a theory to explain these effects, Brown suggests that the light sensitiveness of selenium may be a special case of a property common to all substances. Thus selenium would hold a unique position in regard to this special property, just as iron, nickel, and cobalt do in respect to magnetism. Brown also calls attention to the fact that the experimental results cannot be explained on the usual hypothesis of free electrons. The theory which he suggests is quite similar to the theory of metallic conduction proposed by Sir J. J. Thomson to which reference has already been made.

The light-sensitiveness of selenium has led to its use in various forms of photometry. Recently attempts have been made to apply it to the measurement of the intensity of X-rays. The experiments of Voltz along this line were far from successful, but Fürstenan showed that this failure was due to the use of a form of selenium which is very slow in reaching its maximum change in resistance. Both Fürstenan and Guillemont have developed satisfactory methods for measuring the intensity of a beam of X-rays by its effect on selenium.

WORK AT LOW TEMPERATURES. The "pursuit of the Absolute Zero" seems to have been abandoned at least temporarily by Onnes and his associates. This does not mean, however, that they have been idle. In fact, the number of contributions from the Low Temperature Laboratory of the University of Leyden is increasing each year. But at present the aim appears to be to use the facilities of that laboratory for adding greatly to our data on the properties of bodies at the low temperatures already attained rather than to attempt to narrow the interval of one or two degrees which separates "the lowest known temperature" from the "absolute zero."

This work includes the study of means for measuring such low temperatures, investigations on the change of electrical resistance in a magnetic field and the Hall effect in several metals, determinations of the specific heats of lead and copper, etc. Aside from the fascination and interest of this work at extreme conditions, such data are invaluable in theoretical investigations.

PHYSICS, SOLAR. See ASTRONOMY, *Mount Wilson Solar Observatory.*

PHYSIOGRAPHY. See GEOLOGY.

PICKARD, SAMUEL THOMAS. American journalist, died Feb. 11, 1915. He was born in Rawley, Mass., in 1828, and received an academic education in Maine. From 1852-59 he was editor and proprietor of the *Portland Transcript*. He was literary executor of John Greenleaf Whittier and undertook the publication of many works relating to the poet, including *Whittier's Life and Letters* (1894), *Whittier as a Poet* (1901), *Whittier Land* (1904), *Life and Letters of John Greenleaf Whittier* (1907). He also edited *Hawthorne's First Diary* (1897).

PIERS. See DOCKS AND HARBOURS.

PIG CLUBS. See STOCK RAISING AND MEAT PRODUCTION.

PIG IRON. The production of pig iron of all kinds in the United States in 1914 was 23,332,244 long tons, compared with 30,966,152 tons in 1913, a decrease of 7,633,908 tons, or nearly 25 per cent. The market production of pig iron was 22,263,263 long tons, valued at \$298,777,429, compared with 30,388,935 long tons, valued at \$458,342,345 in 1915. The total value of blast-furnaces on Dec. 1, 1914, was 451. See IRON AND STEEL.

The following table gives the production of pig iron in 1913-14 by States in long tons:

State	1913 Quantity	State	1914 Quantity
Pennsylvania	12,954,936	Pennsylvania	9,783,869
Ohio	7,129,525	Ohio	5,283,426
Illinois	2,927,882	Illinois	1,847,451
New York	2,187,620	Alabama	1,826,929
New Jersey	2,057,911	New York	1,559,864
Alabama	2,057,911	New Jersey	1,557,855
Indiana	1,775,883	Indiana	1,557,855
Michigan	1,775,883	Michigan	1,557,855
Wisconsin	867,326	Wisconsin	329,526
Minnesota	867,326	Minnesota	329,526
Virginia	841,815	Virginia	271,228
Missouri	841,815	Missouri	271,228
Colorado	324,263	Colorado	267,777
California	324,263	California	267,777
West Virginia	324,263	West Virginia	267,777
Kentucky	315,731	Kentucky	236,393
Mississippi	289,959	Mississippi	216,738
Maryland	280,541	Tennessee	195,594
Tennessee	280,541	Maryland	195,594
Connecticut	12,810	Massachusetts	6,594
Massachusetts	12,810	Connecticut	6,594
Total	30,966,152	Total	23,332,244

a Bureau of statistics of the American Iron and Steel Institute.

PIGS. See STOCK RAISING AND MEAT PRODUCTION.

PINERO, SIR ARTHUR. See DRAMA, AMERICAN AND ENGLISH.

PINTADOITE. See MINERALOGY.

PITTSBURGH, UNIVERSITY OF. An institution for higher education, founded at Pittsburgh, Pa., in 1787. The total attendance in all departments in the autumn of 1915 was 3418. There were 360 members of the faculty. There were no noteworthy changes in the membership of the faculty during the year, and no noteworthy benefactions were received. The productive funds amounted to about \$525,000, and the annual income to about \$500,000. The library contained about 22,000 volumes. The chancellor of the university was Samuel B. McCormick.

PITTSBURGH-LAKE ERIE CANAL. See CANALS.

PLAGUE. After an interval of nearly a year, a case of human plague occurred in the city of New Orleans, in the latter part of August, the diagnosis being confirmed on September 8th. The exact source of infection was not determined, but it was believed that it was received in the city. This case demonstrates the difficulties surrounding the eradication of the disease as well as the value of coöperation between the United States Public Health Service and the Department of Health, since no other case occurred after the experts of the Public Health Service took hold of the situation. The preventive activities are illustrated by the fact that 118 ships were fumigated with sulphur, 144 with carbon monoxide, 15 with hydrocyanic acid gas; 54 foul bills of health were issued; 56,233 rats were trapped; 101,226 premises were inspected; and 7281 buildings were made rat proof. Among the 18,605 rats examined, 169 were classed as suspicious and 7 were found to have the plague. See VITAL STATISTICS.

PLANETS. See ASTRONOMY.

PLANT BREEDING. See HORTICULTURE.

PLANT QUARANTINE. See AGRICULTURAL LEGISLATION.

PLATINUM. Comparatively small quantities of crude platinum are produced in the United States, and the production is limited almost entirely to two States, California and Oregon. The production in California in 1914 was 463 ounces, and in Oregon 107 ounces. An output of platinum is made from the refining of gold and copper bullion, of both domestic and foreign origin. From these sources 3430 ounces were obtained in 1914. The imports of crude platinum in 1914 amounted to 30,304 troy ounces and of unmanufactured platinum 38,781 ounces. There were also imported 46,553 ounces of manufactured productions, valued at \$2,908,303. This was a decrease of nearly 50 per cent from the imports of 1914, and was due chiefly to the unsettled conditions abroad. The embargo placed upon the exportation of platinum from Russia at the outbreak of the European war resulted in greatly reducing the quantity of refined and manufactured platinum shipped from France and England, and the shipments from Germany stopped entirely. The considerable output of platinum in 1914 was 263,543 troy ounces, of which about 240,200 ounces came from Russia. Other countries which produce smaller quantities are Colombia, Canada, New South Wales, and Tasmania.

PLIOTRON. See WIRELESS TELEGRAPHY AND TELEPHONY.

POETRY. See FRENCH LITERATURE; GERMAN LITERATURE; ITALIAN LITERATURE; LITERATURE, ENGLISH AND AMERICAN; SCANDINAVIAN LITERATURE; and SPANISH LITERATURE.

POINCARÉ, President of France. See FRANCE, *History, passim.*

POLAND. See RUSSIA.

POLAR RESEARCH. If polar explorations have been less in number in 1915 than in 1914, they have nevertheless been of greater geographical interest. They include the first Northeast Passage ever made from Bering Strait westward to the White Sea; the definite elimination of Crocker Land from our maps; and an extension of Parry Archipelago northwestward into the area of unknown regions.

ANTARCTIC. The expedition under Sir E. H. Shackleton sailed from South Georgia, in the

Endurance, to occupy winter quarters on the coast of Luitpold Land, in about 78° S. latitude, early in January, 1915. From the ship, it was expected that Shackleton with six others would start about November 1st and cross the Continent of Antarctica to McMurdo Sound, Victoria Land, where they hoped to meet a party at the end of March, 1916. The *Endurance* was to return to South Georgia in February, 1916. The exploration of the Kerguelen Archipelago, by Captain Rallier du Baty, was discontinued in 1915 owing to the war. Du Baty has, however, constructed six charts and outlined nine anchorages of the West and South coasts, besides much data on glaciation and geology. Besides exploring unknown areas he made important corrections in locations already charted. These corrections attain their maximum on the West Island, which was no less than 10 miles in error as to its latitude.

ARCTIC. The most notable polar achievement of the year 1915 is the circumnavigation by Vilkitsky of Asia in the ice-breakers *Taimyr* and *Vaigatch*, the first Northeast Passage ever made from Bering Strait westward. Vilkitsky distinguished himself in 1913, while engaged in his special work of surveying the waters to the north of Siberia, by navigating the ocean to the northward of the New Siberian Archipelago, to which he added two new islands, and by the discovery of Nicholas II Land, north of Cape Chelyuskin. Leaving Vladivostok in July, 1914, he first added another island to the Bennett group, and then further explored Nicholas II Land. Its southern end lies within 30 miles of Cape Chelyuskin, whence it extends northwestward 200 miles to about latitude 82° N., longitude 93° E. Instead of narrow islets, the new archipelago proves to be land of considerable area, one of the islands extending 100 miles across, from east to west. Delayed by his explorations, Vilkitsky, after passing to the west of Chelyuskin, found himself forced by an early winter to seek refuge in Taimur Bay, where he wintered, 1914-15. With opening summer he proceeded to Archangel. During the early winter Vilkitsky was greatly surprised to learn through his wireless equipment that another Russian expedition was wintering near him, with which he established communication by sledge. It was the *Eclipse*, in which Sverdrup was seeking lost explorers. Lieutenant Brussiloff attempted in 1912 the Northeast Passage, when his ship was beset in Kara Sea and carried northward by drift of the pack to the 83rd parallel of north latitude, off the east coast of Franz Josef Land. Part of the crew abandoned the ship and reached land in 1914. Sverdrup, in their search, was obliged to winter in about 74° 45' N. on the west coast of Taimur Peninsula, whence he returned to Europe in September, 1915. It may be here noted that Lied made, in 1915, successful navigation to and from the Yenesei,—the third consecutive season of uninterrupted voyages. Wireless land stations keep in touch with ships, advising them of ice-conditions, so that Siberian-European sea-trade appears to be definitely established.

Full reports from Macmillan confirm the previous report of the non-existence of Crocker Land. It will be recalled that Peary in 1906 reported "the faint white summits of a distant land," and later from another point "a little more distinctly the snow-clad summits of the distant land." After four years of preparation

Macmillan, with Ensign Green, reached the designated site on the Great Frozen Sea, on April 21, 1914, reached 32° 30' N., 108° 22' W., a spot "30 miles inland" of the reported land, with "not a thing in sight. Our hopes ended." Misfortune followed the voyage of the *Cluett*, which, under Dr. Hovey, sought to bring Macmillan's party back from Etah, Greenland. The *Cluett* arrived at North Star Bay, September 12th, and was neither able to reach Etah nor to return home. She has provisions for two years, and other supplies. In 1914, by a daring and prolonged sledge journey of 96 days over the ice of the Arctic Ocean, V. Stefansson hydrographically surveyed large areas of the sea to the north of Alaska and to the west of Banks Land. The continental shelf is situated about 70 miles north of the Alaskan coast, but it closely follows the west shore of Banks Land. Beyond the shelf the soundings were often indeterminate, as he had but 750 meters of wire. Of them he says: "These soundings seem to indicate that the sea bottom rises in at least three terraces towards Banks Land. In some parts the bottom is either hilly or cut by channels." In February, 1915, Stefansson sledged north for exploration from his base at Cape Kellett, Banks Land. Filling in the unknown portions of Prince Patrick Island, Stefansson discovered to the north an unknown land, which he reached on June 18, 1915, in 78° N., 117° W. As far as seen—100 miles—trending from the southeast to the northwest, it was a mountainous land of considerable extent. Forced by advancing summer to abandon the field, Stefansson renewed his work in the autumn. Sailing northward from Cape Kellett on Sept. 3, 1915, Stefansson planned to establish a more northerly base from which he could reasonably hope to fully explore the new land already discovered. His exploration of the west coast of Banks Land shows that it has several refuge harbors, instead of being the precipitous, cliff-continued land that it was formerly supposed to be.

POLITICAL AND SOCIAL SCIENCE, AMERICAN ACADEMY OF. A learned society founded in 1889 for study of political and social science. Its membership is about 6000. The society's official publication, the bi-monthly *Annals*, of which Clyde Lyndon King is editor, in 1915 dealt with the subjects: "Public Policies as to Municipal Utilities," January; "Readjustments in Taxation" (E. M. Patterson, editor of this volume), March; "Industrial Opportunity," and "Total Disability Provision" (J. Russell Smith, editor), May; "America's Interests as Affected by the European War," July; "America's Interests After the European War," September; "Public Budgets" (A. R. Hatton, editor), November. The officers for 1915 were as follows: President, L. S. Rowe, University of Pennsylvania; vice-presidents, Carl Kelsey, University of Pennsylvania, Charles W. Dabney, University of Cincinnati, and David P. Barrows, University of California; secretary, J. P. Lichtenberger, University of Pennsylvania; and treasurer, Charles J. Rhoads, Federal Reserve Bank, Philadelphia. The 20th annual meeting of the Academy will be held on April 14-15, 1916.

POLITICAL ECONOMY. Numerous articles will be found elsewhere in this volume treating various matters of economic interest under their own headings. Under **FINANCIAL REVIEW** is given a general survey of business conditions

1-69) the retroactive inhibition has "no positive introspective evidence" in its favor, nor do other results indicate its presence. A. Wohlgemuth (*Brit. J. of Psychol.*, vii, 434-452) concludes that associations of objects comprehended as a whole are most strongly retained, and argues for the association of ideas through simultaneity of experience. This simultaneity, according to K. Lambrecht (*Zeits. f. Psychol.*, lxxi, 1-55), is able to counteract the instruction to abstract the form of objects from their color in associative presentation. In spite of the negative instruction, both factors influence the reproduction. The method of diagnostic association has again been put to experimental test by H. W. Crane (*Psychol. Rev. Monog. Supp.*, xviii, 1-61). In one series, criminal acts are performed before witnesses, who are afterward subjected to the tests; the practical results are negative. T. H. Haines, on the other hand, finds diagnostic value in certain mental performances (*Psychol. Rev.*, xxii, 299-305); in tests of moral discrimination, for instance, defectives are differentiated from normals.

Imageless thought is the subject of R. S. Woodworth's presidential address to the American Psychological Association (*Psychol. Rev.*, xxii, 1-27). The address sets forth a theory of "mental reactions"; percepts are taken to be "inner reactions to sensation." These reactions, which are as distinct in type as the motor reactions, are the units revived in recall. The recall, then, is always couched in terms of the facts previously noted, and these facts constitute the meanings. T. V. Moore (*Psychol. Rev.*, xxii, 177-225), in an attack on the theory of meaning as context, finds in experiments with visual material that meaning often precedes imaginal content. He concludes, therefore, that imaginal content cannot be the condition of meaning; meaning is "a definite mental process *sui generis*." G. A. Coe (*Psychol. Rev.*, xxii, 87-98) suggests a new classification of mental functions. The main classes are biological mental functions, which constitute the mind's reaction to environment, and preferential functions, which are qualitative in aspect and typify the likes and dislikes of the mind.

PSYCHOTHERAPY. The Freudian analysis of dreams has proved its practical value according to M. Solomon (*J. of Abnorm. Psychol.*, x, 19-31) in that it gains the confidence of the patient in tracing the history of his case. R. Bellamy (*ibid.*, 32-45) thinks, however, that the Freudian theory is neither new nor plausible, and that suggestion has played an important part in its formulation. A. Myerson (*ibid.*, 1-10) assumes a simpler mechanism than the sexual complex in his interpretation of a typical case of hysteria, i.e. an attempt on the part of a young wife to gain the sympathy of her husband. C. D. Fox in his comprehensive treatment of *The Psychopathology of Hysteria* grants to Freud the honor of having done more than any one else in the successful interpretation of the disorder. A. W. Van Reuterghem (*J. of Abnorm. Psychol.*, ix, 369-384; x, 46-66) makes the point that Freud and his colleagues do not disparage hypnotic and other treatments: "Freud explains it in this manner: when one treats the patient by hypnotic suggestion, one introduces a new idea from the outside in exchange for the morbid idea; if psychoanalysis is applied, then one simply eliminates the mor-

bid idea." An outline-history of the Freudian doctrines and their interpretation is given.

In an address before the Psycho-medical Society of London, C. G. Jung (*ibid.*, ix, 385-399) points out the advantages of the reductive method. It brings the individual mind back to its simplest motives, while other methods build up from the present condition on false or deteriorated foundations.

PSYCHOLOGY, EXPERIMENTAL. See **PSYCHOLOGY, *passim*.**

PSYCHOTHERAPY. See **PSYCHOLOGY**, section so entitled.

PUBLIC BUILDINGS. See **ARCHITECTURE.**

PUBLIC DEBT. See articles on various countries.

PUBLIC LANDS. See **LANDS, PUBLIC.**

PUBLIC SCHOOL ADMINISTRATION. See **EDUCATION IN THE UNITED STATES.**

PUGILISM. See **BOXING.**

PUMPING MACHINERY. In many American and European cities the use of rotary pumps driven by alternating current motors was found advantageous for high pressure fire service and for general supply. At the Austerlitz plant in the city of Paris, six three-phase motors with the shaft mounted vertically were installed. Each of these motors gives 500 horse power and operates at 700 revolutions per minute. At the Montsouris city plant a single phase motor of 200 horse power and 42 cycle frequency of another design was installed. The alternating current motor is particularly useful for centrifugal pumps and many other installations have been equipped with them. One of the striking developments in pumping machinery of the year was a series of mammoth screw pumps of new design which developed high efficiencies for low lift. These pumps were located in the various branch stations for pumping the storm drainage of the city of New Orleans, and are intended to supplant the older screw pumps, developing a much greater efficiency in times of flood when they are needed. These new pumps have a 12-foot screw placed at the top of the siphon instead of submerged, each unit consisting of a cylindrical casing 12 feet in diameter, and 13 feet 9 inches in length, with its axis horizontal. This casing contained the impeller or moving plates and the stationary or diffusion plates. The latter was mounted in a watertight cone-shaped housing, within which is a main bearing and a marine type thrust bearing. On the suction side the pump is connected to a cast iron 45° bend, through which the shaft extends through a stuffing box, and is directly connected to a 600 horse power electric motor by means of a flexible coupling. The discharge pipe is of riveted sheet steel bolted to the pump casing and contains a 45° bend and sections increasing in diameter up to 15 feet at the lower end. These new pumps were designed and patented by A. B. Wood, engineer of the sewerage and water board of New Orleans, and enable a number of much larger units to be employed than were ever built for centrifugal pumps.

PUMPS. See **PUMPING MACHINERY.**

PURDUE UNIVERSITY. A State institution for higher education founded in 1869 at Lafayette, Ind. The total enrollment in all departments in the autumn of 1915 was 2137. The faculty numbered 210. During the year J. C. Austin, professor of botany, retired, and

R. L. Zackett, professor of sanitary and hydraulic engineering resigned. The university received a residuary bequest from Moses Fell Dunn of Bradford, Ind., amounting to about \$100,000. The total endowment at the end of the fiscal year 1915 was \$1,500,000. The library contained about 100,000 volumes.

PUTNAM, FREDERIC WARD. American anthropologist and zoölogist, died Aug. 14, 1915. He was born in Salem, Mass., in 1839, and graduated from Harvard University in 1862. In 1856 he was appointed curator in the Essex Institute, subsequently becoming superintendent of the museum, Essex Institute and East India Marine Society. From 1861-63 he was director of the museum of the Peabody Academy of Sciences in Salem. In 1874 he was assistant in the Geological Survey of Kentucky, and took part in the survey west of the 100th meridian. He was appointed professor of American archaeology at Harvard University in 1886, serving until 1909, when he became professor emeritus. From 1874 until 1909, he was curator of the Peabody Museum of Harvard University. From 1909-13 he was honorary curator. He was professor of archaeology and director of the anthropological museum of the University of California from 1903-09. From 1882-89 he was State Commissioner of Inland Fisheries of Massachusetts. He served as chief of the department of ethnology at the Chicago Exposition, 1891-94, and from 1894-1903 as curator of archaeology at the American Museum of Natural History. He was a member of many scientific societies in the United States, and in foreign countries. For varying terms he edited the *Proceedings* of the Essex Institute; the *Reports* of the Peabody Academy; the annual volumes of the American Association for the Advancement of Science; anthropological publications of the University of California; and the publications of the Peabody Museum of Harvard. He was one of the founders of the *American Naturalist*. He published over 400 papers on zoölogy and anthropology, and from 1871 was engaged in researches and explorations concerned with American archaeology.

PYORRHŒA ALVEOLARIS (Rice's Disease). The formation of pus pockets at the roots of the teeth, accompanied by atrophy of the outer surfaces of the roots involved, and erosion of the alveoli, or sockets, in which the teeth are implanted; the destructive process being due to the presence of *endamoeba gingivalis*, or other form of *endamoeba*. The researches of the last two years culminated in positive statements during 1915, as to the causation and treatment of this disabling and dangerous disease. The infection from the teeth attacked becomes systemic, and causes chronic arthritis, chronic gastritis, facial neuralgia, chronic laryngitis, obstinate severe headaches, as well as suppurative disease in distant parts of the body. Wright and White, of the United States navy, used with great success deep muscular injections of mercury, together with local treatment described as follows: Careful expression of the pus from the sockets, removal of the tartar and calcareous formations, extraction of hopeless roots and teeth, and applications of tincture of iodine, tincture of aconite and chloroform to the margins of the gums. The preferable salt of mercury is the succinimid.

Gros in 1849 observed and described with

great accuracy the condition and named the animalcule. But it was the researches of Barrett-Bass and Johns, and Chiavero during the last two years that gave us the present knowledge, and furnished us with a remedy in the drug emetin, the active alkaloidal principle of *ipecacuanha*. The remedy is used by hypodermic injection into the gums, or by dropping into the cavity between the tooth and gum, separated by air pressure. Oral sepsis as a factor in remote suppurative conditions had been emphasized by Billings, Rosenow, and others. One of the most frequent conditions dependent on pyorrhœa is pernicious anæmia, which is relieved by the emetin treatment.

QUAKERS. See FRIENDS, RELIGIOUS SOCIETY OF.

QUARANTINE OF PLANTS AND ANIMALS. See AGRICULTURAL LEGISLATION.

QUEBEC. A province of the Dominion of Canada. The area is 706,834 square miles; population (1911 census), 2,005,779. (See CANADA, section *Area and Population*.) The city of Quebec, the capital, had in 1911 78,710 inhabitants. The province is administered by a Lieutenant-Governor, who is appointed for five years by the Governor-General of the Dominion, and who acts through a responsible executive council. The legislative power is vested in a legislative council of 24 members appointed for life, and a legislative assembly of 81 members elected for five years. Lieutenant-Governor, P. E. LaBlanc, appointed Feb. 10, 1915. Premier and attorney-general, Sir Lomer Gouin.

QUEBEC BRIDGE. See BRIDGES.

QUEENSLAND. A state of the Commonwealth of Australia, situated north of New South Wales and east of the Northern Territory and South Australia. The estimated area is 670,500 square miles. Population, as returned by the census of April 3, 1911, 605,813, exclusive of full-blooded aboriginals; as estimated March 31, 1915, 685,138. The capital is Brisbane, which with suburbs had in 1911, 139,480 inhabitants. Governor in 1915, Major Sir Hamilton John Goolld-Adams; Lieutenant-Governor, Sir Arthur Morgan. Premier and attorney-general, T. J. Ryan.

QUIGLEY, JAMES EDWARD. American Roman Catholic archbishop, died July 10, 1915. He was born at Oshawa, Canada, in 1855. Two years later his parents moved to Lima, N. Y., where he attended the public schools. In 1871 he graduated from St. Joseph's College of Christian Brothers at Buffalo. He afterwards studied theology at the Seminary of Our Lady of Angels in Suspension Bridge, N. Y. His ability soon attracted the attention of the authorities, and he was sent to Europe to continue his studies. In 1874 he obtained a degree at the University of Innsbruck, and was transferred to the College of the Propaganda at Rome, where after five years of preparation, he was ordained priest. He returned to the United States, and became the pastor of St. Vincent's Church at Utica, N. Y. After five years he was transferred to St. Joseph's Cathedral at Buffalo, where he remained for 12 years. In 1897 he was made Bishop of Buffalo. He was particularly influential among the Polish dock workers of that city, who were almost all Catholic, and he rendered services of great importance as mediator during the long and bitter dock strikes. In 1903 he was installed Archbishop of

Chicago. Under his direction many parish schools and colleges were founded in that city. He also established hospitals, homes, and dispensaries for the poor of his diocese. Through his influence the first Polish bishop of the United States was appointed for Chicago. One of his most important works was the establishment of the Catholic Church Extension Society, through which hundreds of churches and chapels have been built in small communities in the sparsely settled districts of the United States. On several occasions he protested at Washington against the mistreatment of the nuns and priests in Mexico. He organized the first Catholic missionary congress in the United States.

QUICKSILVER. The production of quicksilver in the United States in 1914 was 16,548 flasks, valued at \$811,680. Of this 11,333 flasks were produced in California, and 5215 in Arizona, Nevada, and Texas combined. The prevailing prices from January to July, 1914, were so low that there was little profit in the industry. Upon the outbreak of the European war, however, prices rose so high that producers were encouraged to make their maximum output. There were 30 producers of quicksilver in the United States in 1914, compared with 24 in 1913. Twenty of the producers were in California, seven in Nevada, and three in Arizona and Texas combined. The average domestic price of quicksilver in California was \$49.05. The imports of quicksilver in 1914 amounted to 614,859 pounds, valued at \$271,984. The exports amounted to 1446 flasks of 75 pounds each, valued at \$70,753.

RABIES. The results of the antirabic inoculation at the Pasteur Institute in Paris for 1914 shows that the mortality from hydrophobia has almost disappeared. In 1912, 395 persons were treated; in 1913, 3330 were treated; in 1914, 373 were treated without a single death. See also **VETERINARY MEDICINE.**

RACING. Thoroughbred racing, killed for the time being in Europe because of the war, has taken on a new lease of life in the United States, judging from the interest and enthusiasm the sport aroused in 1915. There was a marked increase in attendance at all the American meetings, this being especially true at the tracks in the vicinity of New York City.

Harry Payne Whitney, who, owing to the death of his brother-in-law, Alfred Gwynne Vanderbilt, leased his racing stable to L. S. Thompson, headed the list of winning owners with more than \$100,000. Of this total \$68,671 was won on the Jockey Club tracks, *Dominant* earning \$18,945 and *Thunderer* \$17,385. To these amounts must be added the purses captured by *Borrow* and *Regret* through their victories in Kentucky, which amounted to \$23,150.

Other leading winners were August Belmont, \$50,003; R. T. Wilson, \$40,399; H. C. Hallenbeck, \$23,380; Andrew Miller, \$22,310; James Butler, \$20,685; Greentree Stable, \$17,585; Quincy Stable, \$17,080; Gifford A. Cochran, \$16,720; R. F. Carman, \$16,333; J. E. Davis, \$15,005; H. C. Bedwell, \$14,975; John E. Madden, \$13,030; John O. Talbott, \$11,475; Thomas Hitchcock, \$11,435; Dave Leary, \$11,340; Schuyler L. Parsons, \$11,070; Edward McBride, \$10,330; Captain E. B. Cassatt, \$10,085; Emil Herz, \$10,030.

Andrew Miller's *Roamer* deserves special mention among the horses of the year, winning seven

races, including the Saratoga Handicap, Saratoga Cup, and Havre de Grace Handicap. H. P. Whitney's *Regret* was another horse that stood out, her principal victories being in the Kentucky Derby and the Saranac Handicap. Other horses to gain the limelight during 1915 were August Belmont's *Stromboli*; H. P. Whitney's *Borrow*, *Thunderer*, and *Dominant*; R. T. Wilson's *Tartar*; H. C. Hallenbeck's *The Finn*; Schuyler L. Parsons's *Phosphor*.

The winners of the more important stakes were: Metropolitan Handicap, August Belmont's *Stromboli*; Futurity, H. P. Whitney's *Thunderer*; Brooklyn Handicap, R. T. Wilson's *Tartar*; Brighton Handicap, R. T. Wilson's *Olambala*; Excelsior Handicap, J. W. Messervy's *Addie M*; Carter Handicap, S. L. Parsons's *Phosphor*; Suburban Handicap, August Belmont's *Stromboli*; Saratoga Handicap, Andrew Miller's *Roamer*.

The leading jockey of the year was Tommy McTaggart, who made a name for himself in handling two-year-olds as well as in actual number of victories won.

Racing in England suffered from the war, and in France no meetings were held. For the first time since 1780 the English Derby was not run over Epsom Downs. The New Derby Stakes contested for at Newmarket were captured by Sol Joel's *Pommern*.

Harness racing, judging by the chain of meetings conducted on the Grand Circuit, had one of its most successful years. The 10 members of the circuit—Cleveland, Detroit, Kalamazoo, Grand Rapids, Montreal, New York, Hartford, Syracuse, Columbus, and Lexington—kept racing stables occupied for 13 weeks and distributed among winning owners \$417,518. A total of 1447 entries—trotters and pacers—competed on the Grand Circuit tracks.

A world's record of winnings on the American harness turf for one season was made by *Peter Scott* which captured purses to the total value of \$36,285, to which might be added \$14,410 won at the Panama-Pacific Exposition meeting, or a grand total of \$50,695.

More than 20 new world's records were made. *Directum I* paced a mile at Syracuse in 1:56¾ as against his own old mark of 1:58, and *William* paced a mile to wagon in 1:59½, a reduction from the record of two seconds. *Peter Volo* set a new world's figure for a four-year-old trotting colt and equaled the world's trotting stallion record of 2:02.

RACQUETS AND COURT TENNIS. Clarence C. Pell of the Tuxedo Racquet and Tennis Club proved supreme in the racquets world in 1915. He captured the national singles amateur championship and was a member of the team that won the national doubles title. In the final round of the singles tournament Pell defeated Lawrence Waterbury, who had held the championship in the two preceding years, by a score of 3 matches to 1.

Stanley G. Mortimer and Pell then deposed Dwight F. Davis and J. W. Wear of the St. Louis Racquet Club as doubles champions. In the professional ranks Jack Soutar of New York City retained his championship laurels.

Jay Gould successfully defended his title in court tennis by defeating Joshua Crane, challenger, at 6-4, 6-2, 6-2. In the doubles Gould and W. H. T. Huhn defeated Crane and George R. Fearing at 6-1, 0-6, 6-1, 6-3. Walter A.

Kinsella won from Jack White in a professional match by a score of 4-6, 6-3, 6-3, 6-2.

RADIOACTIVE FERTILIZERS. See FERTILIZERS.

RADIOACTIVITY. See CHEMISTRY; GEOLOGY; and PHYSICS.

RADIOMETER. See ASTRONOMY.

RADIO-TELEGRAPHY. See WIRELESS TELEGRAPHY and TELEPHONY.

RADIUM. See CHEMISTRY, GENERAL PROGRESS OF, *Organic Chemistry*; and CHEMISTRY, INDUSTRIAL.

RAILWAY ACCIDENTS. The fiscal year 1915 showed a marked reduction in the number of railway accidents in the United States, and in the loss of life as reported by the Interstate Commerce Commission. At last, the effects of the "Safety First" movement—the improved facilities in the way of equipment, signals designed to secure safer operation, etc.—were manifest. In saying this, it must not, however, be forgotten that there was decreased railway traffic caused by the business depression. For the year ended June 30, 1915, excluding trespassers, the total number of fatalities was 3537, as shown in the accompanying tables. This was less than in any year since 1900, and over 27 per cent less than in 1914; while the number of passengers carried one mile in 1915 was 106 per cent greater, and the number of tons of freight hauled one mile about 92 per cent greater than in 1900. The total number of casualties in 1915 was 170,661, including 8621 persons killed and 162,040 injured. In 1914, 9893 persons were killed, and 192,662 injured, as will appear from the accompanying table. The year 1915 afforded a marked improvement in all respects, including trespassers, against whom a campaign was being actively waged by the railroads, both in the way of education and securing increased punishment. Another important element of the record for 1915 was the fact that but 410 fatalities occurred in train accidents. In short, the total number of persons killed in 1915 was less than in any other year since 1902, and the number of injuries less than in any year since 1911. In 1915, approximately 1,000,000,000 passengers were carried, while in 1898, when the number killed was less than in 1915, only 798,000,000 were carried.

The number of train accidents in 1915 was 11,542, as compared with 15,006 in 1914, or a decrease of 23 per cent, and these accidents consisted of 3537 collisions—a decrease of 32 per cent; 6846 derailments—a decrease of 20 per cent; 1159 accidents—a decrease of 3.4 per

cent. The number of collisions was the smallest in 10 years. The number of collisions and derailments combined was the smallest, except in 1909, since 1903. The number of passengers killed in train accidents in 1915 was 89, as compared with 85 in 1914, and with that exception was less than for any other year since 1899, although the number of passengers carried one mile in 1914 was 146 per cent greater than in 1899. The total for the two years 1914 and 1915 combined was slightly greater than the average for the previous ten years, which was 164 per cent.

FATALITIES IN CONNECTION WITH 10 YEARS' OPERATIONS OF AMERICAN RAILROADS

	Passengers	Employees	Trespassers	Other Persons Not Traversing	Fatalities in Train Accidents only (including those in the foregoing)
1906	418	3807	5881	949	1093
1907	647	4353	5612	1088	1464
1908	406	3358	5489	918	807
1909	385	2456	4944	915	651
1910	421	3388	...	...	932
1911	356	3163	5284	1154	867
1912	318	3235	5434	1198	859
1913	403	3301	5558	1288	849
1914	265	2850	5471	1307	626
1915	222	1809	5084	1168	410

* Not reported.

An important feature of the American accident statistics is that while collisions have been decreasing, derailments have been increasing. In 1902 there were 8675 train accidents reported, of which 5042 were collisions and 3633 were derailments. In 1908, the collisions had decreased and derailments had increased until their number was about equal. In the year ending June 30, 1915, derailments outnumbered collisions almost two to one, the figures being 3538 collisions and 6849 derailments. Of 40 derailments which the Commission investigated during the year, 11 were caused by bad track. The Commission sums up the matter as follows: "The remarkable increase in speed and weight of trains in recent years confirms the necessity for further investigation to determine with accuracy the stresses to which equipment and track are subjected under present service conditions in order to establish safe working limits for their use."

This already has involved the reduction of speeds, for with an increase of speed defects in track are likely to develop and increased damage in case of a derailment.

SUMMARY OF CASUALTIES TO PERSONS FOR THE YEARS ENDED JUNE 30, 1915 AND 1914

Item	Steam railways		Electric railways		1915		1914	
	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured
Passengers:								
In train accidents	89	4,648	85	7,001	9	769	18	1,182
Other causes	133	7,462	180	8,120	26	1,696	40	2,047
Total	222	12,110	265	15,121	35	2,465	58	3,229
Employees on duty:								
In train accidents	221	3,371	452	4,823	9	111	9	100
In coupling accidents	90	1,993	171	2,692	...	14	2	25
Overhead obstructions, etc.	45	1,083	89	1,490	...	21	2	28
Falling from cars, etc.	368	10,748	497	14,568	7	134	8	126
Other causes	870	20,865	1,314	27,273	8	221	25	289
Total	1,594	38,060	2,523	50,841	24	501	46	568
Total passengers and employees on duty	1,816	50,170	2,788	65,962	59	2,966	104	3,797

Item	Steam railways				Electric railways			
	1915		1914		1915		1914	
	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured
Employees not on duty:								
In train accidents	5	72	5	117	...	4	...	16
In coupling accidents	...	1	...	2	...	...	...	...
Overhead obstructions, etc.	10	...	8	5	...	...	...	...
Falling from cars, etc.	45	287	54	370	...	18	1	13
Other causes	165	470	265	608	8	5	2	5
Total	215	840	327	1,097	8	25	3	34
Other persons not trespassing:								
In train accidents	7	110	9	148	1	25	1	4
Other causes	1,156	5,280	1,298	5,827	190	1,093	247	1,081
Total	1,163	5,390	1,307	5,975	191	1,118	248	1,085
Trespassers:								
In train accidents	88	161	75	178	...	...	...	...
Other causes	4,996	6,287	5,896	6,176	103	106	168	139
Total	5,084	6,448	5,471	6,354	103	106	168	139
Total accidents involving train operation	8,278	62,848	9,893	79,388	356	4,215	523	5,055
Industrial accidents to employees not involving train operation	343	99,192	409	113,274	16	932	28	1,058
Grand total	8,621	162,040	10,302	192,662	372	5,147	551	6,108

DERAILMENTS—STEAM RAILWAYS

Causes	Year ended June 30, 1915				Year ended June 30, 1914			
	Number	Persons—		Damage to road and equipment and cost of clearing wrecks	Number	Persons—		Damage to road and equipment and cost of clearing wrecks
		Killed	Injured			Killed	Injured	
<i>Due to Defects of Equipment</i>								
Defective wheels:								
Broken or burst wheel	335	8	53	\$894,569	380	4	29	\$455,335
Broken flange	346	2	49	811,556	534	8	100	526,247
Loose wheel	100	1	11	69,122	117	1	74	97,739
Miscellaneous wheel defects	86	...	29	49,467	118	2	65	66,766
Broken or defective axle or journals	367	6	104	362,766	425	2	120	340,185
Broken or defective brake rigging	390	3	54	261,704	580	9	162	398,458
Broken or defective draft gear	280	8	41	173,106	411	2	57	253,978
Broken or defective side bearings	141	...	37	108,093	148	3	44	110,928
Broken arch bar	222	6	77	269,817	276	1	66	278,695
Rigid trucks	177	4	65	92,057	217	...	39	113,774
Failure of power-brake apparatus, hose, etc.	353	9	45	175,563	260	1	25	130,631
Failure of couplers	219	3	32	102,750	238	2	18	116,134
Miscellaneous	400	9	169	277,563	512	15	276	468,918
Total	3,416	54	766	2,648,133	4,186	50	1,074	3,858,088
<i>Due to Defects of Roadway</i>								
Broken rail	272	6	527	\$342,342	311	24	810	\$387,053
Spread rail	90	3	147	55,339	217	3	147	126,327
Soft track	354	3	292	191,456	356	...	218	254,265
Bad ties	61	3	39	27,384	62	3	113	29,760
Sun kink	32	2	96	29,374	27	3	21	22,701
Irregular track	415	11	231	290,032	512	12	227	373,333
Broken or defective switch or frog	202	9	126	127,798	299	13	294	186,702
Miscellaneous	81	6	82	56,858	104	8	157	131,152
Total	1,507	48	1,540	1,120,583	1,888	66	1,987	1,516,843

SUMMARY OF ACCIDENTS RESULTING FROM COLLISIONS AND DERAILMENTS FOR THE 10 YEARS ENDED JUNE 30, 1915 *

Year	Number	Persons—		Damage to road and equipment and cost of clearing wrecks
		Killed	Injured	
1906	13,455	977	12,686	\$10,659,189
1907	15,458	1,291	16,236	12,865,702
1908	13,034	728	12,334	10,133,660
1909	9,670	608	9,560	7,480,203
1910	11,779	773	12,579	9,328,958
1911	11,865	735	11,793	9,351,780
1912	13,698	772	15,096	11,527,458
1913	15,526	791	14,565	13,049,214
1914	13,806	605	11,437	10,965,181
1915	10,387	382	7,554	7,800,898

* For the years prior to 1911 the figures for persons killed and injured are restricted to passengers and to employees on duty. Returns for electric railways are included in the figures for the same years.

The *Railway Age Gazette*, Dec. 31, 1915 (p. 1252), reported that the mileage of railways in the United States operated under the block signal system on Dec. 31, 1915, was 97,809 miles, an increase during the year of 9677 miles. Of this, 31,160 miles was automatic block signal mileage, as compared with 29,689 for the previous year, while the remainder was operated on the manual block system. Practically all the large railways had under consideration plans for the extension and improvement of their block signal systems, which varied all the way from the extensive reconstruction on the New York, New Haven, and Hartford, where automatic signals were to replace the control system, to the Long Island, which was considering plans to install a considerable number of manually operated block signals.

Rail failure statistics for the year ended Oct. 31, 1914, are tabulated in the September *Bulletin of the American Railway Engineering Association*. As a general average the failures per 10,000 tons of Bessemer rails were about double those of open-hearth rails. A table was given showing the ranking of the mills as regards rate of failures for the rollings of the years 1909, 1910, 1911, and 1912, and a comparison with the 1914 statistics indicated as a general average of all of the mills, a gradual decrease in the rate of rail failure of rollings for the successive years since 1908, with which year's rolling the records started.

SAFETY OF PASSENGERS. An excellent record for the year ending June 30, 1915, was made by the Union Pacific, which carried in the previous 12 months 4,550,949 passengers without a fatality to a passenger. In 1915 229 passengers were injured, as compared with 333 in 1913, which was the last year before the Bureau of Safety was organized. In 1915 28 employees were killed, as compared with 59 in 1913, and 4537 passengers were injured as compared with 6097 in 1913. A good record was also enjoyed by the entire Pennsylvania Railroad system, with its 26,000 miles of track. On Dec. 31, 1915, there were completed two years without a single one of the 361,572,114 passengers carried in that period being killed in a train accident, figures for November and December being estimated. The lines east of Pittsburgh completed their third successive year without a single train accident fatality to one of the 320,000,000 people carried in the three-year period. In five of the eight years ending with 1915—1908, 1910, 1913, 1914, and 1915—more than 520,000,000 passengers were carried by the Pennsylvania lines east of Pittsburgh on 4,000,000 trains without a single loss of life in a train accident.

A large number of accidents were reported during the year, manifestly due to the carelessness of motorists at crossings, often where adequately guarded. So many were experienced on the Long Island Railroad, where a large number of such accidents had taken place, that the officials of that line were led to redouble care, and in many places to install heavy pole gates. In several instances these gates were broken down by motorists who did not stop at the warning. At a single corner, on Long Island, on the Merrick Road at Springfield, on August 8th, 9408 automobiles passed, and in a single hour 845 motor cars, or more than 14 a minute, crossed the tracks. The abolition of

grade crossings is taking place in many suburban districts as rapidly as possible, but during the year increased attention was being given to extra care by drivers of motor cars, and considerable public sympathy was enlisted on the side of the railways as a result of their campaign of publicity against such practices.

UNITED STATES. In the United States there were fewer accidents than usual where great loss of life ensued. A number of the more important are summarized herewith and show the tendency towards safety in railway operation. A collision took place in Detroit, Mich., between a street car and a string of freight cars pushed by a switching engine, on the Detroit, Toledo, and Ironton Railroad, in which 15 persons were killed and 20 injured, on April 14, 1915. The motorman on the street car misunderstood the signal of his conductor who had been sent ahead to investigate, and the car on application of the power ran down an incline and on to the crossing. An accident due to a washout near Lake City, Minn., on the Chicago, Milwaukee, and St. Paul, resulted in 3 being killed, and 10 injured, on June 5th; while the malicious removal of a rail near Birmingham, Ala., on the Seaboard Air Line, produced an accident in which 3 were killed and 15 injured. An accident due to a collision between two passenger trains occurred near Thurmont, Md., on the night of June 24, 1915, on the Western Maryland Railroad. This collision took place on a high bridge. The baggage car of the west bound train fell to the ravine below. Both engines were badly damaged but they remained on the bridge, as did the rest of both trains. In the baggage car which fell there were two passengers and the baggage master, who were killed; while one engineman, one fireman, and a traveling fireman were also killed. Several persons were injured. The collision was due to a mistake by a train dispatcher sending conflicting orders. A few days later—June 27th—there was a collision between two freight trains near Platte River, Mo., on the Chicago, Rock Island and Pacific, in which three employees were killed and five were injured.

A rear end collision between a standing passenger train and a freight train, resulting in the death of seven passengers, occurred on the Baltimore and Ohio Southwestern Railroad at Orient, Ohio, Aug. 12, 1915. The accident was due to the fact that the engineer of the freight train in a heavy rain was not running under control, and the passenger train did not exercise adequate precautions in the way of flagging and throwing off fuses. The car in which the passengers were killed was of wooden construction with open platforms. Another serious accident of the year occurred in September in a tunnel of the Philadelphia and Reading Railroad at Phoenixville, when 9 workmen were killed and 9 injured, these being members of a gang of 50 who were run down while walking along the track by a southbound passenger train, running on the northbound track. It was claimed that the unusual operation of the train should have been explained to the foreman and workmen before entering the tunnel, and the misunderstanding averted by a written order. The railway claimed that the conductor of the work train had given proper notice to the construction gang.

A serious accident, not connected, however, with

operation, occurred on Sept. 27, 1915, at Ardmore, Okla., where the explosion of a tank car filled with gasoline resulted in the deaths of 39 people, injuries to a large number, and the destruction of property valued at between \$500,000 and \$1,000,000. The explosion was due to the fact that the gasoline, loaded at a temperature of 50° Fahrenheit, had been standing on a side track at Ardmore, where the temperature was 93° in the shade, and the immediate cause was the removal of the dome cap of the tank car, while the tank was subjected to interior pressure. While there are regulations for the transportation of gasoline and other explosives, yet the occasion seemed to emphasize the need of absolute compliance with the requirements of the Railroads Bureau of Explosives regulations.

On October 16th a passenger train of two cars, consisting of a gasoline motor and a passenger car was derailed near Randolph, Kan., the result of a washout which damaged the roadbed, but not sufficiently to change its surface appearance. The accident occurred on a bank at an approach to a bridge, and the passenger car was thrown down into a stream, its forward end being submerged; 11 passengers were drowned, and 3 seriously injured. On the 18th of October a southbound passenger train was derailed near Brownsville, Texas. Three passengers were killed and several injured. This accident was thought to be due to obstructions placed on the track by Mexican bandits, who, as soon as the train was stopped, entered the passenger car and began shooting. One of the serious collisions of the year occurred Oct. 19, 1915, at Agawam, Okla., between a passenger train and a freight train, on the Chicago, Rock Island, and Pacific Railway, causing the death of seven persons and fatal injuries to several others. In November a butting collision occurred on the Central of Georgia, four miles east of Columbus, Ga., between a northbound passenger train and a southbound special, carrying a show, in which at least seven persons were killed and many injured. The engines of both trains were wrecked, and while the steel cars of the passenger train were not badly damaged, 10 or more cars in the circus were wrecked and destroyed by fire, and many wild and tame animals were killed, while a number of wild animals escaped.

GREAT BRITAIN AND IRELAND. The year 1915 was the worst on record so far as safety of passengers was concerned for the railways of Great Britain. In the 12 months, 269 passengers were killed in train accidents, beginning on January 1st, when a collision caused by an engineer overrunning his signals, occurred at Ilford, England, in which 10 passengers were killed. On January 28th two women were killed at Kinross, in a collision between a freight train of whose engine the engineman had lost control, and some standing passenger cars. Three passengers were killed in a collision at Smithey Bridge on March 18, in a sand storm where an engineer ran by several signals and dashed into a standing train. The most serious accident of the year was a collision on May 22nd, at Quintinshill, where 228 passengers were killed. On August 14th 10 passengers were killed in an accident at Weedon, in which the Day Irish Mail was derailed. August 16th a passenger was killed at Pollokshaws in a collision due to an engineer mistaking a danger night signal for

a clear signal. Again on September 6th a passenger was killed in a collision between an express train and a derailed car at Newark, and on December 17th occurred a disastrous collision at Jarrow, in which 17 passengers were killed.

The accident at Quintinshill was near Gretna, on the Caledonian Railway, and 228 were killed outright or died of their injuries, and 246 were injured, of whom 191 were passengers in a troop train of 21 vehicles, 51 were passengers on the down express, 1 an employee on the troop train, and 3 employees on the down express. This accident, which was the most serious since the Armagh disaster in 1889, where 80 were killed, was due first to a collision of a special troop train from London with a local train from Carlisle, which had been switched from the down to the up track. A few moments afterwards an express passenger train from Carlisle ran into the wreckage, which by this time was afire, while the down express was telescoped and added its debris to the fire. This accident brought up again the question of rendering the timber used for the construction of railway cars non-inflammable, and as the gas tanks exploded with the heat and fire, it was recommended that electric light be used in all new carriages, as was the prevailing tendency in Great Britain. As a consequence of this accident two signalmen and a fireman were put on trial for culpable homicide. The fireman was found not guilty, but the signalmen received 18 months' imprisonment and three years' penal servitude respectively. Like other railway accidents, in the opinion of the Board of Trade inspector, this was considered exceptional, and the human failure, as in other accidents, was perhaps the leading consideration, as the three employees concerned each failed in his duty though with varying degrees of culpability. The inspector further recommended that track circuits should be employed at all dangerous places like Quintinshill, and that each signal box on the main line be protected with such a device between the home and starting signals, but under such conditions the particular point would have been one of the last to have been so protected, as the track was entirely in view of the signalman in his tower.

The wreck on the North Eastern Railway of England, at St. Bede's Junction, Jarrow, a short distance from Newcastle, December 17th, was caused primarily by a rear end collision, which was followed by fire. Sixteen passengers and 1 fireman were killed and 50 or more passengers were injured. The accident was due to the fact that a signalman had overlooked the fact that a pusher engine which had just assisted a freight train to the top of a grade was standing on the main track, and he admitted a following passenger train to the block section. This train collided with the pusher; and one or two of the passenger cars fell over on an adjacent main track. On this track a train of empty passenger cars was approaching, and before it could be warned, it struck the wreck.

FRANCE. In France the military as well as the normal operation of the railways was remarkably free from accidents in 1914 and 1915. In the latter year, however, two somewhat serious accidents occurred, one at Rochefort on the State Railway lines, May 17th, when 7 employees were injured by the derailment of the Nantes-Bordeaux express, caused by the drop-

ping of a steamship smokestack from a preceding freight train; and the other on October 9th, at Saint Cyr-de-Favières, on the line of the Paris-Lyon-Méditerranée, when 17 soldiers were killed and 30 injured, this being the largest number of fatalities that has marked any accident in France for many years. The accident was due to a special troop train breaking in two, and six passenger coaches running wild jumped the track and rolled into a ravine. France had a unique record for railroad accidents, there being but one passenger killed to 32,000,000 carried, and but one injured to 1,300,000 carried. In the 40-year period since 1875, railroad travel had tripled and had developed to a point where it was far safer than the stage coach, where one passenger was killed to 335,000 carried, and one injured to 50,000 carried. Aside from train accidents, however, with the large number of guards along the line of the railways, it was believed that there would be a considerable number of fatalities to soldier track guards.

MEXICO. Another serious railway accident of the year took place on October 5th on the Mexican Railway on the Maltrata incline (between Orizaba and Boca del Monte), where the line makes an ascent of 4 per cent, which reaches 5 per cent at some stretches. The alignment is very crooked and there are a number of sharp curves. The accident occurred near Alta Luz, tunnel No. 13. In the tunnel the coupling to the engine gave way, and the train was parted from the engine, which, bumping into the cars with sufficient force, released the air brakes and started the train on the down grade. The hand brakes did not avail, and a panic took place among the passengers, nearly all of whom were killed or injured, the number of casualties being estimated at 300, a great majority being fatalities as all who jumped from the train were killed. The engineer and train crew were of Mexicans, and the road was being operated by the Carranza forces, it is said. See also **RAPID TRANSIT.**

RAILWAYS. Some roads, notably the Hill roads (Great Northern, Northern Pacific, and Chicago, Burlington, and Quincy), for years made a persistent and scientific effort to carry the largest possible tonnage of freight with the fewest number of freight trains. By a great many roads, however, this object was pursued in a more or less haphazard fashion, but the movement received a new impetus in 1910 when the roads were forced to make an analysis of their own operations to be used in connection with an appeal to the Interstate Commerce Commission for higher rates. In August, 1914, the railways of the United States and Canada were faced with a situation that called imperatively for drastic action. In the Southeast and some parts of the Southwest in the United States, business came almost to a standstill. The raising of new railway capital was for a time not even considered. The International and Great Northern, the Missouri Pacific, the Chicago, Rock Island, and Pacific, and the Missouri, Kansas, and Texas were forced into the hands of receivers.

In dramatic interest the fact that nearly one-sixth of the entire mileage of the United States was bankrupt comes first in a review of railway history in 1915. As of lasting significance in the development of the science of railroading, however, the fact that railway managers were

forced into devising scientific methods of carrying the greatest possible amount of freight tonnage with the fewest possible freight train miles, ranks of equal, if not greater, importance. Of 35 of the most important roads in the United States, 28 show an increase in tonnage of freight per freight train mile in the fiscal year ended June 30, 1915, as compared with the previous year. The average tonnage of freight per freight train for these 35 roads was 482 in 1914 and 504 in 1915.

When the depression of 1907-08 caused a sudden and large reduction in the tonnage of freight carried by the railways, it was the exception rather than the rule to find a railway which could reduce transportation expenses (the wages of men actually engaged in moving trains and handling freight and passengers, and the cost of fuel and material consumed) in as great proportion as the total loss in revenue. There was an entirely adequate explanation of this. The loss in revenue was both from passenger fares and from freight charges. Only sufficient freight trains need be run to move the freight which is offered, but the passenger trains have to be run in the great majority of cases whether or not there are sufficient passengers to make them pay. The total expenses, therefore, of freight and passenger service would normally show a decrease in greater proportion than the reduction which could be made in transportation expenses. In 1915, however, the majority of the largest roads showed a greater proportional reduction in transportation expenses than in total operating revenues, although in many cases the loss in revenue was greater in 1915 when compared with the previous year than in 1908 when compared with 1907. Far, in a way, the most important factor in the success which was attained in 1915 in effecting economies, was the attention which was given to securing heavier trainloads.

American methods of railway operation have never been scientific in the sense that German railway operation is scientific. The American theory leaves each officer in the organization a fairly broad discretion in the manner of carrying out the orders of his superior. A striking contrast between American and German methods is afforded by the duties of the train dispatcher. In Germany every conceivable situation that may arise in regard to the movement of trains over a train dispatcher's district is cataloged and a rule is made to cover each. It is only left to the dispatcher to apply the proper rule to each situation as it arises. On an American railway a train dispatcher has charge of getting trains over his district. He has certain general rules by which he must be guided, but he is left quite free to deal with each specific instance as his own judgment and ingenuity suggest. An analogous situation has obtained in regard to freight train loading. It is to the interest of the engineman to have little enough tonnage to haul to make sure of getting over his run without delay. The yardmaster who makes up the train does not want to "get himself in wrong" with the enginemen by giving them too long a train, which may result in delay and a reprimand for both the enginemen and yardmaster, and so it has gone. Of course the higher officers of nearly all railway companies have accepted the general principle that the fewer trains that are used to

haul a given amount of freight the less will be the expenses per ton-mile and the greater the net revenue. To put this theory into practice, however, has required a scientific study and supervision which has only been given to it in the last few years on many roads.

Although there has been progress made along these lines in each year since 1910, 1915 was the culmination of these efforts and marks for the majority of railway companies a distinct stage in their history. As previously mentioned, there was a large falling off in gross earnings on most railways for the fiscal year ended June 30, 1915. After July there was considerable improvement, and the calendar year 1915 probably ranked about the same as 1913, and somewhat better than the calendar year 1914. The fiscal year ended June 30, 1916 (all railway companies reporting to the Interstate Commerce Commission report for the fiscal year ended June 30, and most companies make their reports to their stockholders for the same period), bade fair to be better than any year since 1906. The falling off in revenue in the last half of 1914 and the first half of 1915 was due to inactivity in industrial lines, to smaller purchases by retailers and individuals, with consequent smaller shipments of freight, and to loss in passenger revenue, due apparently to the following causes: Business houses reduced their force of traveling salesmen and traveling buyers, and they restricted the expense accounts of the force that they retained. Business men economized by restricting their own traveling expenses, and despite the fact that a great many people who were in the habit of going to Europe for their vacations stayed in America in 1914-15, the passenger travel of this class did not offset, probably, the smaller pleasure traffic where people denied themselves traveling expenses either from actual necessity or because of feeling poor. It is rather interesting to note that most of the transcontinental railroads showed smaller passenger revenue during the year in which the Panama-Pacific Exposition and the San Diego Fair were open than in the previous year. Even in States where the crops were unusually good in the fall of 1914, travel was restricted, apparently from a feeling of a desire to economize.

RECEIVERSHIPS. At one time during 1915 there was between 41,000 and 42,000 miles of railway in the hands of receivers. Two-thirds of the mileage in receivers' hands was in the territory bounded on the east by the line from Chicago to New Orleans, on the north by the line from Chicago to the northeastern corner of the State of Colorado, and on the west by the eastern border of Colorado and a continuation of this line to Mexico. This territory takes in the States of Texas, Oklahoma, Arkansas, Missouri, and Kansas. Texas has in the past probably been the most rabid anti-railroad State in the union. Missouri, Oklahoma, and Arkansas have followed close on Texas in the passage of laws restricting railroad operation and earnings. Many of the roads in the Southwest were financed by a firm of international bankers, which was adversely affected by the war, and this together with the shortsighted policy of the States, accounts in large measure for the fact that while only 32 per cent of the railroad mileage of the entire United States is in the Southwest, 66 per cent of the total mile-

age in the hands of receivers is in that territory. The four largest roads to go into receivers' hands in 1915, were the Chicago, Rock Island, and Pacific, operating 7847 miles of railway; the Missouri Pacific, operating 7285 miles; the Missouri, Kansas, and Texas, operating 3865 miles; and the Western Pacific, operating 946 miles.

The Rock Island situation was extraordinarily interesting and complicated. In 1901-02 Judge W. H. Moore, Daniel G. Reid, and W. B. Leeds acquired a substantial minority of the \$75,000,000 Chicago, Rock Island, and Pacific Railway Company stock in the open market. Previously control of this stock had been held by R. R. Cable, Marshall Field, and certain other wealthy men of Chicago. Messrs. Reid, Moore, and Leeds had made a fortune in tin plate manufacture, and when they had acquired sufficient Chicago, Rock Island, and Pacific stock to elect a majority of the board of directors they devised a double holding company scheme by which stock of the railway company was deposited with one holding company, which issued collateral trust bonds against the railway company stock as collateral, and the stock of this holding company was held by a second holding company—the Rock Island Company of New Jersey—which issued its own common and preferred stock and offered this stock and the collateral bonds of the holding company No. 1 to stockholders of the railway company in exchange for their railway company stock. The holders of the greater part of the \$75,000,000 stock accepted this offer and the scheme went through. Although the par value of the securities of the holding companies was 270 per cent of the par value of the railway company stock, the holders of the new securities never during the entire life of the top-heavy structure received anything but what was paid in dividends (an average of only a little over 5 per cent) on the original Chicago, Rock Island, and Pacific Railway Company stock. The scheme was devised to permit Messrs. Reid, Moore, and Leeds to control the railway company with a minimum of investment, control of the board of directors being vested in the preferred stock of the New Jersey holding company. This permitted the Reid-Moore people to sell their collateral bonds and the New Jersey common stock, still retaining control of the board of directors. The public as shippers and travelers on the Chicago, Rock Island, and Pacific were never affected one way or the other by the holding company scheme. The whole scheme, however, hung on the ability of the railway company to pay dividends. This it could not do in 1914, and the holding companies were wiped out, but the railway company's credit had been so impaired that it could not make arrangements for refunding maturing obligations and was also put into the hands of a receiver.

The Missouri Pacific was one of the Gould roads. It was much overcapitalized, its credit having been used for financing other Gould railway projects, and control of the company was secured by Kuhn, Loeb and Company of New York. This strong banking house proposed a reorganization plan under which all classes of security holders would have accepted certain readjustments, and the holders of junior bonds, and the bonds with a mortgage on what were considered unimportant lines would have ac-

cepted a nominal scaling down of the face value of their securities and accepted a preferred stock in place of a bond. Common stockholders were asked to subscribe sufficient money to rehabilitate the property. It was soon found, however, that it was quite impossible to reconcile the various conflicting interests of security-holders and that the only way to effect a reorganization would be through receivership. The road, therefore, was put into the hands of receivers.

The Missouri, Kansas, and Texas was being particularly well operated. Crop failures and flood damage had been very costly in the previous year, but had there been a normal condition in the railway security market the company ought easily to have pulled through its difficulties. It had \$11,000,000 notes falling due shortly before the sinking of the *Lusitania*. An agreement with the holders of these notes was reached by which all but a very small minority of the notes were extended. After the sinking of the *Lusitania*, however, bankers were more than ever disinclined to make any new ventures, and further flood damage necessitated considerable immediate expenditures of cash on the Missouri, Kansas, and Texas. This situation was made worse by attempts on the part of the holders of the notes that were not extended to compel payment in cash, and it was decided that the best way to preserve the interests of everybody was to place the roads in the hands of a receiver.

The Western Pacific Railway was the extension of the Gould system to the Pacific coast. The Gould system had previously ended at the western extremity of the Denver and Rio Grande Railroad at Salt Lake City, Utah. The road had no local traffic to speak of, and was carried for a while by the Denver and Rio Grande, but receivership had been inevitable for some time.

NEW CONSTRUCTION. Exploitation of railroad property had become unfashionable. The Interstate Commerce Commission's investigations and reports on the Chicago, Rock Island, and Pacific, the St. Louis and San Francisco, and the New York, New Haven, and Hartford affairs discouraged the kind of high finance, using a word which had been very much misused, that was generally believed by the outside public to have yielded high profits to a few individuals in the three cases just mentioned. It was a striking fact, however, that not since 1884 has there been as small a mileage of new railroad built in the United States as was built in the calendar year 1915. The total mileage of first main track built in the United States in 1915 was 933. In Canada there was 718 miles built, and in Mexico 37 miles. Not only was there an almost negligible amount of extension work done, but there were only 356 miles of second track built in 1915.

In his testimony before the Hadley Commission, which was making an investigation of the question of federal regulation of the issuance of railroad securities, Frank Trumbull, chairman of the board of directors of the Chesapeake and Ohio, made the remark that changing a one hundred dollar bill into 100 one dollar bills was an act of irreproachable honesty but not of any particular profit. There is undoubtedly a connection between the remarkably small amount of railroad work done in 1915 and the public

disapproval of promoters' profits in railroad building.

The following table shows the first and second track mileage in each of the States in 1915:

NEW TRACK BUILT IN 1915			
		Miles	
United States—	No. Cos. building	First track	Second track
Alabama	2	58.15	27.85
Alaska	1	34.80	.....
Arizona	2	50.00	.....
Arkansas	1	19.00	1.00
California	4	32.00	.....
Colorado	8	4.78	.....
Florida	6	38.65	.....
Georgia	5	31.64	.....
Idaho .....	..	.....	1.75
Illinois	4	6.90	24.78
Iowa .....	..	.....	8.43
Kansas	4	58.56	4.09
Kentucky	3	48.89	6.92
Maine	1	1.38	.....
Maryland	2	8.40	4.95
Massachusetts	2	2.00	.....
Michigan	2	18.50	1.00
Minnesota	4	46.76	28.18
Mississippi	1	3.50	13.25
Missouri	1	.16	3.85
Montana	1	8.51	.....
Nebraska	1	1.25	.....
Nevada	1	7.00	.....
New Jersey	1	.66	2.00
New Mexico	1	3.66	.....
New York	3	2.84	13.84
North Carolina	3	33.30	39.90
North Dakota	2	26.29	.....
Ohio	3	9.30	7.26
Oklahoma	3	34.74	.....
Oregon	4	32.70	.....
Pennsylvania	9	98.37	44.86
Rhode Island .....	..	.....	.....
South Carolina .....	..	.....	1.00
Tennessee	4	12.15	18.71
Texas	2	4.40	.50
Utah	1	14.95	7.76
Virginia	2	17.80	81.08
Washington	6	70.88	9.27
West Virginia	7	13.78	1.32
Wisconsin	1	29.32	7.78
Wyoming	1	7.37	.....
Total	104	933.24	856.28
Canada	17	718.37	.84
Mexico	2	36.50	.....

LEGAL DECISIONS. From the railroad man's point of view the most important decision in 1915 was that of the Supreme Court in the case which the Norfolk and Western appealed from a law of West Virginia fixing a rate of two cents per mile for passenger fares. The principal ground on which the railway company had made its appeal was that a rate as low as two cents a mile made passenger business unprofitable and did not yield an adequate return on the value of the property used in that service. The West Virginia courts had held that the profit on all of the business, freight, express, mail, etc., as well as passenger, shown by the Norfolk and Western was sufficient to yield an adequate return on the value of all the property used in all classes of service. The United States Supreme Court held that this was not sufficient justification for a two-cent passenger rate, and held that a railroad company could properly claim the protection of the Constitution against a law which made one class of service unremunerative. The Court held that each general class of service could not legally be compelled to accept rates which did not yield a fair return on the property used in that particular service. It was pointed out that while the railroad company itself, if it chose, could perform certain classes of service which yielded little more than the actual out-

of-pocket cost of performing the service, neither State commissions nor State Legislatures could compel the railway company to follow this course. In another decision handed down on the same day the Supreme Court applied the same reasoning to a law of North Dakota fixing unduly low rates on coal. The Court held that coal rates can not be fixed by a State law or State commission so low as to make it impossible for this class of service to pay its proportion of fixed charges.

WAGE CONTROVERSIES. The decision of the arbitrators in the Western wage controversy, which controversy was begun in 1914 but continued on into 1915, gave certain advances to certain classes of employees, but in general it was less favorable to the employees than had been the decision in 1914 in the Eastern cases. The demand had been made for increases in wages of enginemen and firemen in all classes of service. The advances granted were principally to men in switching service. As always, the men refused absolutely to accept any leveling down as well as leveling up, so that the only changes which the arbitrators made were increases. The report of the arbitrators was in general an affirmation of the claims of the Western railway managers that they were already paying a very high standard of wages to all classes of men in train service.

LOCOMOTIVE BUILDING. There were 1573 locomotives ordered by the railroad companies of the United States in the calendar year 1915. This was greater by 308 than the number ordered in 1914, but about half of the locomotives ordered in 1915 were ordered between October 1st and December 31st. The two heaviest types of freight locomotives are the Malett and the Mikado. There were 562 Mikado locomotives ordered in 1915, a very considerable increase over 1914, and there were 120 Malett locomotives ordered in 1915 compared with 59 ordered in 1914. Until a few years previously comparatively few locomotives in American railroad service were equipped with superheaters. The economies to be effected by the use of superheated steam had been found, however, to do more than offset the cost of equipping locomotives, which had been in service not more than 10 or 12 years, with superheaters. Progress in this respect would have been even more rapid than it was in 1915 had not the necessities for holding down all capital expenditures to the very lowest possible amount been enforced by the boards of directors and railroad executives. There were at the end of 1915 about 1300 locomotives in the United States equipped with mechanical stokers, since the mechanical stoker is generally conceded to be economical only where the coal consumed by the locomotive is so great as to, under certain conditions, overtax the strength of one man to fire it, the fact that so many mechanical stokers have been put in service is an illustration of the rapidity with which heavier locomotives are replacing the lighter types. The Erie in 1914 built a new type of locomotive, calling it the "Triplex," which was known locally on the road as "The Centipede." It had 12 pairs of driving wheels, four pairs being placed under the tender. In 1915 the Erie ordered two more of this type of locomotive. The one now in service was being used in pusher service, and presumably was proving satisfactory.

EQUIPMENT. The total number of freight cars ordered in 1915 was 107,796. Of these 56,713 were all steel and 23,768 steel frames with steel underframe. Only about 700 to 800 all wood cars were ordered. The total number of passenger cars ordered in 1915 was 3092, and of these 2874 were all steel, 94 were steel underframe, and only one was specifically reported as having been ordered made of all wood. Up to October 1st the cars and locomotives ordered were fewer in number than in any year in the last two decades. With the very large increases in freight business which came in September and October and were in full swing in December, railroad companies found it necessary to place a large number of orders for cars and locomotives, in many instances at prices considerably above what they would have had to pay during 1914 or in the first months of 1915.

ELECTRIFICATION. Two very important electric traction installations on what had been steam mileage were completed. The Norfolk and Western electrified a section of about 30 miles of heavy grade on the main line in West Virginia; the purpose of this electrification was both to reduce the cost of freight service over heavy grades and to increase the capacity of the double track. The Pennsylvania completed the electrification of its suburban lines running out of Philadelphia. The purpose here was to reduce the cost of operation, but also, and more important, to improve the quality of the service and to do away with the smoke nuisance. The Chicago, Milwaukee, and St. Paul put in service in the last half of the year the longest line of both freight and passenger railroad that had yet been electrified. This line was 440.5 miles long. The line crosses the Belt Mountains, the Bitter Pool Mountains, and the Rocky Mountains. The heaviest grades are 1.7 per cent. The total expenditure, it is estimated, will be about \$15,000,000. The object of this electrification was to reduce the cost of operation over heavy grades. See **ELECTRIC RAILWAYS**.

WESTERN RATE DECISION. The Interstate Commerce Commission handed down its opinion in the Western rate advance case on Tuesday, Aug. 11, 1915. The report held:

1. Proposed increased carload rates on grain and grain products considered as one commodity not justified.
2. Proposed increase from 30,000 pounds to 40,000 pounds in the minimum carload weight of grain products justified.
3. Proposed increased carload rates on live stock not justified.
4. Proposed increased carload rates on packing-house products and fresh meats, except as indicated between points on the Missouri River, not justified.
5. Proposed increased carload rates on fertilizer and fertilizer materials not justified.
6. Proposed increased rates on bituminous coal, except as to South Dakota points, justified. The rates on coke here proposed, which are the same as on coal, justified.
7. Proposed increased carload rates on brewers' rice and less-than-carload rates on domestic rice justified.
8. Proposed increased carload rates on broom corn not justified.
9. Proposed increased import rates and proposed increases in carload minima from Gulf ports justified.

10. Proposed increased carload rates on fruits and vegetables justified.

11. Proposed increased carload rates on hay and straw, where not in excess of Class C, justified.

12. Proposed increased any-quantity rates on cotton piece goods, and proposed increased carload rates from points in Texas, not justified.

Commissioners Daniels and Harlan filed dissenting opinions. They agreed with all the increases granted, but contended that others should have been allowed.

See also **ARBITRATION AND CONCILIATION, Strikes and Lockouts.**

RAILWAYS, ELECTRIFICATION OF AT CHICAGO. See **SMOKE ABATEMENT.**

RAINFALL IN UNITED STATES. See **METEOROLOGY**, under the section *Rainfall of the United States.*

RAPID TRANSIT. NEW YORK. The construction of the various subways and elevated railroads to increase the rapid transit facilities of the city of New York progressed actively in 1915. At the end of the year 72 of the 89 contracts had been let, and work was in progress on most of these. The third track on the elevated railways in Manhattan and the Bronx was completed and ready to be opened to traffic in the following year. The third tracks were intended for express service, and were to be operated in one direction only—downtown in the morning, and uptown in the afternoon. The third tracking involved the Ninth Avenue, Third Avenue, and Second Avenue lines in Manhattan, and the Fulton Street and Myrtle Avenue lines in Brooklyn. On the Ninth Avenue the third track was extended so that it would reach from 155th Street to Cortlandt Street, while on Third Avenue express service facilities were provided between Chatham Square and Bronx Park; and on Second Avenue, from Chatham Square to the Harlem River.

In some cases in Manhattan an island platform between the local tracks and the central express track could be built, but at others "over-grade" stations were necessary, as the express track was raised above the local tracks to a level usually of 11 feet 6 inches. A double deck station was built with the upper station platform extending over the local track to the centre express track. These raised portions of the express track not only made access from the platforms possible, but rendered more efficient actual operation, as they assisted in the retardation of the trains stopping at the station and when starting on the incline the acceleration was increased. In many cases the old tracks had to be moved, at others a reconstruction of the stations was necessary, and a removal of the tracks and supporting structure, which was temporarily carried on wooden supports. A new double deck bridge across the Harlem River was also built and successfully floated into position. Were it not for the important subway construction taking place during the year the reconstruction of the elevated, for such essentially it was, at many points would have been considered an engineering feat of no small importance, as often entirely new construction was essential without interfering with the track and the use of the existing structure.

On December 1st the New York Public Service Commission of the First District had completed or had under contract on new rapid transit lines

to be owned by the city of New York, work aggregating \$167,606,969.07, in addition to the construction work on third tracking and extensions of existing elevated railways carried on by the Interborough Rapid Transit Company and the New York Municipal Railway Company, which aggregated about \$26,000,000, making total contracts in force of upwards of \$193,000,000. The total cost of construction of city owned lines was estimated at \$236,000,000, of which the city would supply about \$164,000,000, the Interborough Rapid Transit Company, \$58,000,000, and the New York Municipal Railway, \$14,000,000.

The Fourth Avenue subway in Brooklyn, extending from the Municipal Building in Manhattan to Fourth Avenue and 56th Street, Brooklyn, was opened in June, 1915, in connection with the reconstructed Sea Beach line of the Brooklyn Company, extending to Coney Island, between which point and Manhattan through train service was maintained. The extension of the Fourth Avenue subway from 65th to 86th Street, Brooklyn, was being completed, and it was reported that on the 1st of December the Fourth Avenue subway to the Sea Beach line was carrying upwards of 1,000,000 passengers per month, relieving the congestion on the lines crossing the Brooklyn Bridge and in the first subway.

In June, 1915, the Steinway tunnel, extending from 42nd Street, Manhattan, under the East River to Long Island, and consisting of a two track railroad, was opened. This tunnel had been constructed for a number of years, having been built by Interborough interests at a cost of about \$8,000,000, and was by them transferred to the city of New York under the dual system contract for a consideration of about \$3,000,000. This tunnel became known as the Queensboro subway, and was being extended from the Queens terminus to join with the new rapid transit line to Astoria and Corona, on the Queensboro Bridge plaza. This extension was over 90 per cent completed at the end of the year. The tunnel also was to be extended on the west to a junction with the first subway at Times Square, from which subway trains would run through it and over the new lines in Queensboro.

In Brooklyn, the New York Municipal Railway Corporation completed a new elevated railroad over the route of the Lutheran Cemetery line, and also extended the Fulton Street elevated from Liberty Avenue to Lefferts Avenue, Queens.

Accidents. In connection with the construction of the subways in Manhattan, two serious accidents occurred. In one case, on September 22nd, on Seventh Avenue, at 24th and 25th streets, a blast loosened the shoring and caused a collapse of the street decking for the full width of the roadway for nearly two blocks. As the deck collapsed it carried down with it the street car tracks, including a street car and large motor truck and several delivery wagons. There were seven deaths, four of the men killed being subway laborers, and a number of accidents. On September 25th a slide of rock from the west wall of the subway excavation on Broadway just above 38th Street carried away the supporting posts and produced a collapse of the decking, taking with it the western half of the roadway and the two street car tracks, and caused

the other half of the roadway to sag. An empty taxicab and three pedestrians fell into the hole, and one of these, a woman, was killed, while a workman below was injured. The moving of the rock was due to a slight crack, and was considered one of the unfortunate incidents of such operations, which in the main had been carried on in safety and success in the construction of the New York subways. While there was some criticism of engineers and contractors, yet it was realized that subway construction in New York carried on by the cut and cover method, was done without interfering with the ordinary use of the streets, and involved timbering on a scale unparalleled even in most mining operations. Nevertheless, increased caution, both in construction and inspection of the timbering and other supports, was observed after these accidents.

On Jan. 6, 1915, occurred the worst accident in the history of the New York subway, due to a cable burnout, and resulting in the putting out of commission of the entire system for nearly a day. While there was but one person killed, 200 others were overcome by smoke and gas, and the situation threatened to be serious. As a result of the accident, various improvements were recommended in the arrangement of cables, and conductors, while the elimination of wood cars for those of steel construction was expedited.

BOSTON. The Dorchester tunnels under construction during the year were the latest developments of Boston's underground transportation system. They extend from the direct connection to the Boston terminal of the Cambridge subway at Tremont and Winter streets, run under Winter and Summer streets, the Fort Point channel and Dorchester Avenue, to Andrew Square, Dorchester, a total length of a little more than two miles. One section of this route, namely Section E, which includes the portion under Fort Point channel, a somewhat irregular navigable water way connecting Boston Harbor with a tidal basin, South Bay, presents many interesting engineering features. This section has a length of about 3200 feet, of which 2160 feet is directly under the channel and the remainder under streets and private land, a route selected to avoid expensive easements, and one that offered no serious difficulties to modern tunneling as the tunnels were pushed forward under compressed air with shields, having two working platforms thrust forward by hydraulic jacks to help hold the face. Behind the shields was placed wood block segmental lining which formed the outer shell of each tunnel in much the same manner as cast iron columns were employed. The interior of the wooden shield received waterproofing, consisting of layers of treated cotton fabric and hot asphalt, and then an inside concrete shell with a minimum thickness of 2 feet, unreinforced, was used.

The tunnels were being driven through a stiff blue clay with occasional pockets of sand with hard pan near the bottom, and the minimum depth beneath the channel was 35 feet below mean low water, except at the northerly end, where for a length of 300 feet the depth is from 35 to 25 feet. The minimum thickness of the roof between the top of the tunnel and the bottom of the channel is about 15 feet. The average progress during August was from 10 to 12 feet per day, but it was expected that this would be increased to from 12 to 15 feet after

the belt conveyers which were an interesting feature of the construction were installed.

PHILADELPHIA. On April 29th the citizens of Philadelphia voted favorably on a \$6,000,000 bond issue to begin the construction of an extensive subway system which was planned to cost some \$46,000,000. The existing Philadelphia subway runs east and west under Market Street, terminating in a short north and south elevated line along the river front. The new subway was planned to cross under the present one at the City Hall and extend north and south under Broad Street with a delivery loop in the form of a rough square about one-half mile on a side, providing for discharging the traffic at a number of points in the business district. With the elimination of grade crossings track construction had been designed so that trains may be routed from either direction by or around this loop.

The bond issue of April was to be applied to the construction of the Broad Street line, and funds for work on the loop were to be provided later. The flat character of the portion of Philadelphia traversed by the subway makes possible a form of construction in which the roof of the subway supports directly the street surface so that no back filling with incidental settlement and trouble is required. Where the new subway would cross the former Market Street subway, it was suggested that the space between the roof of the subway and the street could be left open, and one use suggested was for parking automobiles which stand in the centre of Broad Street.

The first bids for the new subway were opened August 16th, which will be paid for with the \$3,000,000 appropriated by the city council, which at the same time appropriated \$3,000,000 for the first elevated section. The subway section on which bids were opened extended from Filbert to Broad Street, under the City Hall, while the elevated section involved the construction of foundations for about four miles of the Frankford elevated line. On the afternoon of September 11th actual construction was begun by the turning of the first spadeful of earth with a silver shovel by Mayor Blankenburg.

CLEVELAND. In Cleveland, Ohio, in 1915, plans were approved calling for a double barreled reinforced concrete subway under 4.4 miles of Euclid Avenue, between University Circle and the Public Square. Each barrel of the structure will have inside dimensions of 10 feet 4 inches by 12 feet 6 inches, and the over all dimensions of both barrels, which will be contiguous, are 25 feet wide by 16 feet high. The open-trench type of construction will be employed, and at all points the sand-crushed stone foundation of the Euclid Avenue pavement will rest directly on the roof of the subway. It was estimated that the total cost of the tubes, exclusive of rolling stock, station embellishment, and the public square terminal, would be \$4,840,000. Construction was promised early in the spring of 1916 by the Cleveland Rapid Transit Company, and the first work planned was the removal of the city water connections in Euclid Avenue. The contract provided that actual construction should begin within 12 months, and at least one double track line from the public square to the city limits should be complete and in operation within 30 months after construction was begun. After construction of the first line at least 5 miles of double track line should be completed in the

next succeeding period of 3 years, and after that at the rate of not less than 5 miles each succeeding 3 years. At the end of the first year construction to the amount of at least \$500,000 should have been expended, and before the end of the second year at least \$1,500,000. This franchise gave to the company the right to dig subways under every important street in Cleveland, and to locate its downtown terminal under the public square. The material in which excavation must be carried on was in many places quicksand, and it was feared this might present unusual difficulties, especially in the business section.

CINCINNATI. The Cincinnati Rapid Transit Commission during the year was working on the preliminary plans for a new rapid transit system for that city, so that the question of issuing \$6,000,000 worth of bonds to finance the project might be submitted to a popular vote in April, 1916. The new subway was to have the double purpose of serving as a rapid transit loop connecting the various hilltop suburbs of Cincinnati, and be the entrance for the various interurban lines, all of which terminated on the outskirts of the city. The problem before the commission was mainly to have the interurban lines establish connection with the new loop system at convenient points. Professor George F. Swain, of Harvard University, was the consulting engineer for the project.

SAN FRANCISCO. Preliminary steps had been taken to ascertain the cost of providing a much needed rapid transit system for that city, where a trip to the western residence district was said to require 20 minutes longer during the rush hours than would be needed with an effective rapid transit system. It was estimated that a double track electric line could be built for \$800,000 per mile for a subway system, while the cost of the surface lines would be about \$215,000 per double track mile.

CHICAGO. In Chicago in the latter part of the year the city council passed an ordinance for the appointment of a committee of three engineers to investigate and report upon the question of subway construction for that city. One member was to be a Chicago man, and the others were to be men familiar with conditions at New York, Boston, and Philadelphia. See **TUNNEL**.

RATES, RAILWAY. See **RAILWAYS**.

RECALL. See **ELECTORAL REFORM**.

RECEIVERSHIPS. See **RAILWAYS**.

RED CROSS, THE AMERICAN NATIONAL. The volunteer reserve emergency organization of the American people to relieve distress in times of peace and war. The year 1915 was by far the most remarkable in the history of the organization, not only by reason of the continuance of the European war and the unprecedented relief measures thereby rendered necessary, but also on account of the more expanded scope, more efficient organization, and improved coördination of the Red Cross with other agencies of relief.

The greater work done in 1915, as well as the imperative need of further reforms, were pointed out at the 11th annual meeting of the organization, held at Washington, on Dec. 8, 1915, in an address by the Hon. William Howard Taft, the chairman of the Central Committee. He also said that Miss Mabel Boardman, the founder of the new Red Cross in the United States, had

been chiefly instrumental in providing a new marble home for the organization in Washington, to be finished in the fall of 1916. A permanent American Red Cross endowment fund of at least \$2,000,000 was asked for by Mr. Taft, and of this \$900,000 has been contributed. It has been calculated that out of a \$2,000,000 endowment fund the overhead charges, emergency calls, and expenses of the regular departments of the first aid and the nursing service can be met. Mr. Taft recommended a change in the financial basis of membership, saying that the Red Cross is much stronger by raising its funds from millions of members of small units than by large contributions from comparatively few. He showed how the present American Red Cross membership of 30,000 could be vastly increased, if a dollar each were contributed by members as membership dues.

EUROPEAN WAR RELIEF. The war found the Red Cross with a registered enrollment of 6000 nurses and the necessary surgeons, besides an equipment for the purchase and transportation of supplies, which resources have enabled it, during 1915 and the latter part of 1914, to send surgical and sanitary units (a unit is a working force of 3 surgeons and 12 nurses sent to a hospital, together with the necessary supplies) for war hospital work and the relief of non-combatants, thereby rendering greater continuous service than was ever given in a foreign war by any Red Cross of a neutral country. There were expended and distributed in money supplies and paid expert service, \$2,000,000. This amount was entirely made up of voluntary contributions. In the early part of the war, to meet the conditions in Belgium, Northern France, Serbia, Poland, and the misery resulting from the terrible losses of life and limb in battles between the Germans, French, Russians, and Austrians, the American people contributed on the whole not far from \$10,000,000. General Devol reported that in England, Russia, France, Belgium, Serbia, Germany, and Austria-Hungary the American Red Cross maintained in 1915, 75 doctors and 255 nurses, for varying periods. An enormous quantity of purchased and donated medical, surgical, and hospital supplies, bed linen, garments, etc., valued at \$1,245,174 was received at the Red Cross shipping depot, Bush Terminal, Brooklyn, and forwarded as rapidly as possible. The superintendent of the shipping station at Bush Terminal, Brooklyn, reported that 150 shipments were made, aggregating 25,259 cases, weighing 3,851,415 pounds, since the beginning of the war and during the greater part of 1915. If to these figures be added the supplies afterward sent up to Jan. 16, 1916, there were 175 shipments, weighing 4,798,402 pounds, and the value of the donations was about \$1,000,000.

Miss Jane A. Delano, in submitting the sixth annual report on the nursing service, said that the department now has 40 State and 74 local committees, covering all large nursing centres in the United States. She also said that in European countries where modern training schools for nurses had not yet been established the American Red Cross had established a definite standard of nursing which will surely produce results later. Valuable experience had been gained in by far the widest field of operations ever known; the nurses had learned how to care for

large numbers of patients in the shortest possible time without disturbing the routine of the hospital; they had shown by their own conduct and deportment that women can be mobilized without confusion, that their chances of illness when carefully selected seem to be no greater than men's. The experience gained had also indicated the special type of nurse most desirable for this kind of service. It was also felt that it will now be possible for the American Red Cross to do a splendid piece of constructive work for the United States, and to guarantee a satisfactory nursing personnel not only in national relief work in time of calamity, but an efficient service should the United States be confronted by war.

The director general of civilian relief, Mr. Ernest P. Bicknell, elected to that office at the annual meeting in 1915, had previously been loaned by the American Red Cross to direct a large part of the stupendous non-combatant or civilian relief work of the Rockefeller Foundation in the European war zone. This work consists in the collection and forwarding of supplies for the relief of refugees and those rendered helpless and homeless by remaining in their own country. The supplies are consigned to committees doing this work and officially recognized by the American Red Cross. Large quantities of clothing for women and children and special layettes for babies were sent to Belgian refugees in Holland, Northern France, and England. In Serbia and Montenegro the American Red Cross, in conjunction with the Rockefeller Foundation, suppressed the epidemic of typhus fever, which destroyed 150,000 lives. The value of supplies sent to Serbia alone amounted to \$149,707. Dr. James F. Donnelly and Dr. Ernest P. Magruder lost their lives from typhus fever as a result of their heroic work in suppressing the epidemic.

NATIONAL RELIEF. The work of the First Aid Department was energetically carried on in 1915. For the 10 months ended November 27th the sale of first aid supplies brought in, in revenue, \$28,491, as compared with \$18,116 during all of 1914, a gain of 64 per cent. Since June, 1914, 7265 lumbermen had received instruction in first aid and accident prevention. The first aid instruction cars in 1915 traveled 22,977 miles, and 46,839 railway employees were instructed in first aid and accident prevention by Red Cross staff doctors, who gave 818 lectures. The number of life saving corps organized by the life saving branch of the Medical Bureau were more than doubled in 1915, having reached a total of 86. The Town and Country Nursing Service in 1915 received a generous gift from Jacob H. Schiff, making it possible for a larger number of nurses to take post-graduate courses. Of the 223 applicants for enrollment, nearly 100 failed to come up to the higher standard now established. A notable example of scientific relief was afforded by the consolidation of various agencies under the American Red Cross, following the capsizing of the steamer *Eastland* in the Chicago River and the drowning of over 900 persons. The work of apportioning relief funds was carried on and a pension system for dependents of the victims had been arranged. Nearly \$372,000 was raised for this work. Another case of relief work was that of the Newport, Ark., flood. Mexican refugees in Brownsville, Texas, and other border points were cared

for, and the veteran Union soldiers in the Grand Army of the Republic encampment in Washington were attended to.

INTERNATIONAL RELIEF. There were several cases of relief given in 1915 to sufferers from disasters outside of the United States and apart from the European war. The American Red Cross did much in behalf of hungry and destitute persons in Mexico City, and also in the southern part of the Mexican Republic. Many thousands of starving non-combatants were cared for during the past summer and early fall. One measure was the opening of free soup kitchens. Destitute Americans were also assisted. Other instances of relief were those of the suffering caused by the fire at Colon, Panama; the famine in Haiti, for which \$1500 was contributed, besides purchases of medical and surgical supplies; and the earthquake and typhoon in the Samoan Islands. The islands affected were the Manua group, which formerly belonged to Germany, but shortly after the opening of the war came under British authority. Colon, though a city of Panama, is under the sanitary control of the United States.

HOME RESERVE. The name "Home Reserve" has been given to agencies organized under the military authority of the United States for the purpose of accumulating supplies which are to be used for calamity or war. Receiving stations, with hospitals, will be found in 12 prominent cities whose situations will command all parts of the country, and supplies will be sent from each city nearest to the place of calamity or to the indicated centre of possible military urgency, in order that the cost of transportation may be lessened and the greatest practicable speed attained in forwarding relief.

THE NEW YORK "UP-TOWN" OFFICE. By reason of the increased work which suddenly developed on account of the European war it became impossible for the executive office in Twenty-second Street to attend to all the matters demanding consideration, and the result was the opening of an up-town office on the second floor at 661 Fifth Avenue. The office was primarily intended for an information bureau, but it has also been very useful as a reception depot for supplies, which have been and are being shipped from the office to any part of the European war field. A capable executive and a large number of alert and obliging assistants are busy answering countless calls for information, ranging from the proper way to knit a sock or muffler, or fold compresses, to the exact location of a nurse in a field hospital "somewhere in France." Between October, 1914, and July 1, 1915, 107 cases were packed and shipped abroad.

ADMINISTRATION. The annual meeting of the American Red Cross was held at Washington, D. C., Dec. 8, 1915. The president of the society, Woodrow Wilson, President of the United States, ex-President William Howard Taft, chairman of the Central Committee, and Robert W. de Forest, vice-president of the society, presided at different times during the three sessions—morning, afternoon, and night—of the meeting, which was very largely attended by representative American humanitarians. The programme was of extraordinary variety, and the discussions had this highly beneficial result: a movement was initiated whereby numerous American war relief organizations, representing

different and independent interests, are expected to cooperate heartily and actively, should there come a grave national emergency, either as war or natural catastrophe. Important changes in the by-laws, proposed by the Central Committee and ratified by the General Board of Delegates, were made to increase general efficiency in 1916. The vice-chairman of the Central Committee, Maj.-Gen. Arthur Murray, U. S. A., retired, was appointed to serve as active executive in charge at the national headquarters in Washington in the absence of former President Taft, who will maintain his headquarters in New Haven, Conn. In lieu of the office of national director, filled since 1908 by Ernest P. Bicknell, the offices of director general of military relief and director general of civilian relief will hereafter have jurisdiction over varied relief operations classified under their headings.

Maj.-Gen. George W. Davis, U. S. A., retired as chairman of the American Red Cross Central Committee, after filling that office with great ability for eight years. He was unanimously awarded the American Red Cross gold medal of merit. Special certificates of merit were conferred upon Rabbi Henry Cohen, of Galveston, Texas, and Dr. J. L. Renfro, Brownsville, Texas.

The officers for 1916 are: President, Woodrow Wilson, President of the United States; vice-president, Robert W. de Forest; director general of military relief, Col. Jefferson R. Kean; director general of civilian relief, Ernest P. Bicknell; treasurer, John Skelton Williams, United States Comptroller of the Currency; counselor, John W. Davis, solicitor-general of the United States; secretary, Charles L. Magee. Executive committee of the Central Committee as now constituted (W. H. Taft, chairman of the Central Committee, and General Murray, vice-chairman of the Central Committee, are ex-officio chairman and vice-chairman, respectively, of the executive committee): Mabel I. Boardman; Robert W. de Forest; Franklin K. Lane, secretary of the interior; Maj.-Gen. William C. Gorgas, surgeon-general of the United States army; Rear Admiral William C. Braisted, surgeon-general of the United States navy; Charles D. Norton; Alfred T. White. See RELIEF FOR WAR VICTIMS.

REFERENDUM. See ELECTORAL REFORM.

REFORM, ELECTORAL. See ELECTORAL REFORM.

REFORMED CHURCH IN AMERICA (DUTCH REFORMED). This denomination had, in 1915, 126,847 communicants, an increase of 3704 over 1914; 1759 churches, and 750 ministers. For administrative purposes it is divided into four particular synods and 35 classes corresponding to the presbyteries in the Presbyterian Church. The Sunday schools had over 160,000 pupils. The denomination contributes annually for benevolent and missionary purposes about \$500,000, and for congregational purposes, about \$1,700,000. Its missionary work is in charge of the board of foreign missions, the women's foreign mission board, and the domestic missionary board. The board of education and board of publication regulate educational and publishing interests. The officers of the General Synod are Isaac W. Gowen, president; John Lamar, vice-president; Henry Lockwood, stated clerk; Clifford P. Case, permanent clerk. The General Synod meets at Holland, Mich., in June,

1916. The denominational headquarters are at 25 East Twenty-second Street, New York City.

REFORMED CHURCH IN THE UNITED STATES, known also as the **GERMAN-REFORMED CHURCH.** This denomination had, in 1915, 320,459 communicants, an increase of 7709 over 1914; 1759 churches, and 1213 ministers. The affairs of the denomination are administered by eight district synods, and 59 classes corresponding to the presbyteries in the Presbyterian Church. The Sunday schools had, in 1915, over 250,000 pupils. The missions of the church are carried on in practically all the States of the Union and in Canada. Theological seminaries are maintained at Lancaster, Pa., and Dayton, Ohio. The colleges include Franklin and Marshall College, and Heidelberg College, at Tiffin, Ohio. Colleges for women are maintained at Frederick, Md., and Allentown, Pa.

REFORMED EPISCOPAL CHURCH. In this denomination there were, according to the latest available returns (1913), 10,800 communicants, 80 churches, and 83 ministers. There are six bishops at the head of the denomination. Domestic missions are carried on among the colored people of South Carolina, and foreign missions are maintained in India. The theological seminary is in Philadelphia, and in the same city is published the official organ, the *Episcopal Recorder*.

REFORMED PRESBYTERIANS. Under this title are included five branches. The Associate Reformed, South; the Reformed (Synod); the Reformed (General Synod); the Reformed (Covenanted); and the Reformed in the United States and Canada. The Associate Reformed South is the largest branch. In 1915 it had 14,821 communicants, 155 churches, 113 ministers. The Reformed (Synod) had, in the same year, 8634 communicants, 111 churches, and 128 ministers. The Reformed (General Synod) had 3300 communicants, 17 churches, and 16 ministers. The Reformed (Covenanted) had 40 communicants and one church. The Reformed in the United States and Canada had 360 communicants, one church, and one minister. The Reformed (General Synod) maintains two churches in India. It has a theological seminary in Philadelphia and a college at Cedarville, Ohio.

REFUSE DISPOSAL. See GARBAGE AND REFUSE DISPOSAL.

REINDEER. See ALASKA, section so entitled.

RELIEF FOR WAR VICTIMS. The outbreak of the European war very soon made it evident that millions of innocent victims in the fighting areas would be without independent means of support on account of the wholesale destruction of property, the confiscation of food supplies, and the paralysis of industry. This was first illustrated in Belgium where it was estimated that by November, 1914, over 6,000,000 persons had been rendered homeless and 1,500,000 destitute. The prosecution of the war, however, resulted in the creation of a similar situation in Russian Poland, in Galicia, and in Serbia. The situation in Poland was indeed even worse than that in Belgium. Finally, the unprecedented butchery of the Armenians by Turks, rendered relief of the remnant of the Armenian population an absolute necessity.

As early as September, 1914, relief organizations began to be formed in the United States.

Committees sprang into existence all over the country with the result that at first there was considerable duplication. Gradually, however, relief activities were systematized under central committees. Throughout 1915 numerous organizations seeking relief for special classes of victims continued to operate and all were most generously supported. By far the most important of all organizations in the world was the Commission for Relief in Belgium; but numerous other funds, many of which are noted below, performed work necessary to the life and welfare of war victims. All sorts of devices for raising money were resorted to, including appeals through newspapers, endless-chain whist parties, fairs and bazaars, theatrical and musical performances, "tag" days, balls and fêtes of various kinds, and appeals through churches and other organizations.

COMMISSION FOR RELIEF IN BELGIUM. This was the most extensive relief organization, embracing all neutral countries. It was brought into existence through the activities of the American and Spanish ambassadors at London and ministers at Brussels, the American ambassador at Berlin, and the American minister at The Hague. In addition to the six foregoing, its honorary chairman in 1915 included the American ambassador in Paris, and the Netherlands' minister to Belgium. Its chairman was Herbert Hoover; it had directors in Belgium, Holland, and Great Britain, besides Mr. Lindon W. Bates, in America. Moreover, there were national organizations in America, Spain, Italy, and England, besides a most extensive distributory organization in Belgium and Northern France. Affiliated with it was a Woman's Section. During 1915 it carried out the distribution of its aid in Belgium through the Comité National de Secours et d'Alimentation. Similarly on account of the devastation in the occupied French territory the Comité d'Alimentation du Nord de la France was organized. Its American headquarters were at 71 Broadway, New York City; and there were other principal offices in London, Rotterdam, and Brussels. It had, in 1915, assembling depots in every State in the United States, and representative executives in all but 12 States. It transported free of charge from any point in the United States all gifts.

The committee secured pledges from England, Holland, and Germany permitting the transportation of food products to the occupied territory, and the pledge of Germany that such food would not be confiscated for war purposes. The general policy of the commission was to coöperate with organizations of every sort in Belgium in the distribution of relief. It thus created over 4000 distributing committees in Belgium and Northern France; local committees were brought into existence in nearly every commune of the occupied territory, and over these were district and provincial committees all under the Comité National above mentioned. The work was carried out under three main divisions: the Provisioning Department; the Financial Relief and Exchange Department; and the Benevolent Department. The Provisioning Department provided food for about 7,000,000 people in Belgium and 2,300,000 people in Northern France. Up to June 30, 1915, it had secured over 600,000 tons of foodstuffs for the Belgian section, valued at over \$45,500,000. These foodstuffs were re-sold to the population, and the profits thus se-

cured were used by the Benevolent Department in the care of destitute. These profits were due entirely to the volunteer executive, commercial, and transportation services, which were valued during the first eight months at \$4,800,000. The Financial Relief and Exchange Department facilitated remittances of money to the amount of \$20,000,000, with the result that 500,000 persons were saved from destitution. The Benevolent Department secured up to June 30, 1915, a total of over \$31,000,000 for the support of 2,750,000 destitute persons in 700,000 families. Both food and clothing were supplied at an expenditure during 1915 of \$5,000,000 per month. Food was given out through a system of canteens covering all Belgium, meals being thus supplied to destitute persons at a per capita cost of only eight cents per day. There were also baby canteens, cheap restaurants, meals for school children, and in some cases provision of shelter. Besides these activities the commission gave aid to or through the following: a committee to aid doctors and pharmacists by supplying medicines, serums, and other necessities; child institutions working for the better feeding of infants, the aid of private and public orphanages, and assistance to war orphans and other homeless children; the treatment of indigent consumptives; an agricultural committee to control the supply of seeds and fodder; a committee for the aid and protection of artists; some 50,000 lace workers, mostly Belgian women; destitute foreigners; refugees from other localities; a committee for the rehabilitation of churches; local workrooms for the repair of clothing for the destitute; and miscellaneous grants to Cardinal Mercier for trade training for maimed soldiers, and for maternity hospitals.

Up to June 30, 1915, gifts of money from all parts of the British Empire reached a total of \$4,850,582; cash gifts from the United States totaled \$311,939; the Belgian Relief Fund (see below) had sent \$502,025; from commissions in China, Italy, and Spain had been received \$85,716; and Belgian institutions and Belgians abroad had supplied \$16,222,701. Gifts of foods and clothing are not included in these figures.

During the year it became evident that relief for the civil population in Northern France was necessary. Consequently the Comité d'Alimentation above mentioned was created. This began active work about April 1, 1915, and during the next three months distributed food products valued at \$14,193,000. In addition it supplied clothing. During the later months of 1915 the commission made a persistent appeal for new clothing of all kinds, and for cloth suitable to be made into clothing for 3,000,000 people in Belgium and France. It had organized workshops in the relief territory for the manufacture and repair of clothing.

BELGIAN RELIEF FUND. This fund "for women, children, and other non-combatants" had its headquarters at 10 Bridge Street, New York City. Its president was Rev. J. F. Stillemans. Mr. Robert W. de Forest was chairman of the executive committee; and J. P. Morgan and Co., treasurer. It embraced numerous local committees, including one in every State. Up to the close of 1915 it had collected \$1,080,000 in cash; and food supplies valued at \$1,000,000. In coöperation with the Rockefeller Foundation it had sent into Belgium foodstuffs to the amount of \$1,000,000. Most of the cash received was spent for food, but small sums were sent to

refugees in Holland and to war victims in the unoccupied parts of Belgium. The cost of transporting and distributing food products sent by it was borne by the American Commission for Relief in Belgium, so that the fund became a central agency for the collection of cash gifts and for the expert purchasing of food supplies.

JEWISH RELIEF. On account of the great number of Jews in Poland and other parts of Europe who suffered extreme privation as a result of the war, the American Jewish Relief Committee for Sufferers from the War was organized with Felix M. Warburg, 52 William Street, New York City, as treasurer. Toward the close of the year a most active campaign for funds was undertaken. A memorable meeting was held in Carnegie Hall on December 23rd, at which more than \$500,000 was secured. Local committees were formed in cities throughout the country. While the prime movers were Hebrews, there were many non-Jews who assisted in securing funds. By the close of the year \$1,881,743 had been sent to needy Jews abroad, and plans for the dispatch of \$500,000 more for general relief in Russia, Poland, Galicia, Austria-Hungary, Greece, and Palestine, for Jewish students in Switzerland, and refugees in Alexandria, were nearly completed. Mass meetings were to be held in all principal cities early in 1916 under the direction of a National Committee of One Hundred.

In Great Britain was formed the Russian Jews' Relief Fund for the aid of Jews in Russia and Poland. It had branches in all principal cities. This was a national non-sectarian fund administered in Russia through a committee at Petrograd headed by Baron Günzburg. By means of it over 120 local relief centres were feeding every day more than 200,000 homeless and destitute Jews.

In Russia a central relief committee at Petrograd sent out word that military authorities had forcibly removed 250,000 Jews from their homes in the occupied territory, and that 200,000 more had left voluntarily. The committee had opened employment agencies in 31 cities and equipped 10 workshops. Its most valuable activity had been the extension of credit through coöperative loan societies in 17 different places. In addition, hospitals, asylums, infirmaries, and schools were opened. The Russian government had contributed 1,500,000 rubles to the work of this committee.

OTHER FUNDS. There were a considerable number of other agencies collecting money and supplies for the relief of special classes of victims. Thus there was the American Ambulance Fund, collecting means for the support of the American Hospital in Paris. Its treasurer was J. P. Morgan and Co., 23 Wall Street, New York. The Duryea War Relief Fund of which the Union Trust Company, New York, was the treasurer was headed by Mrs. Nina L. Duryea. The American Girls' Aid for the collection of clothing for war victims in France had executive offices at 50 Broad Street. The Fund for the Relief of Women and Children in France, headed by Mrs. Whitney Warren, 16 East 47th Street, reported a total of more than \$122,000 at the close of 1915. The Dollar Christmas Fund, with Henry Clews as treasurer, was organized to purchase shoes for destitute Belgian children. It had received about \$75,000 by means of which more than 100,000 pairs of shoes had been sent

to the poor children of Belgium. The Vacation War Relief Committee, of which Miss Anne Morgan was chairman, and the office of which was at 38 West 39th Street, reported aggregate gifts of \$186,123. At the very close of the year it issued an appeal for contributions of phonograph records and phonographs for distribution among French and English hospitals and in the camps. The distribution of such gifts was to be carried out by the American Fund for French Wounded, which was assisting some 500 small hospitals. Mrs. Ethelbert Névin, 38 West 39th Street, was chairman of this fund, which reported gifts of \$15,575. Mr. Frederic R. Coudert, 2 Rector Street, New York, was treasurer of the War Orphans' Fund, for the care of French war orphans. The Cardinal Mercier Fund, organized to collect money to be distributed for relief work in Belgium by Cardinal Mercier and of which J. P. Morgan and Co., 23 Wall Street, was treasurer, reported a total of about \$15,000. The National Allied Relief Committee, of which Dr. Charles W. Eliot was president and Lee, Higginson and Co., Boston and New York, was treasurer, was one of the most active at the close of 1915, giving special attention to relief in Serbia. The Prince of Wales National Relief Fund in the United States, of which R. W. Stuart Wortley, 25 Broad Street, was treasurer, reached a total of \$146,228 at the close of the year. This fund had headquarters in Great Britain, and branches in the various colonies. Its total aggregated many millions of dollars. The Lafayette Fund with offices at the Vanderbilt Hotel, New York, sent comfort kits to the soldiers of France; it had collected \$102,040. The Committee of Mercy was engaged in forwarding necessities for women and children, such as condensed milk, food, and clothing. Its treasurer was August Belmont, 200 Fifth Avenue, and its total gifts, \$143,202. The War Children's Relief Fund had headquarters at 35 West 39th Street. It secured contributions from women's clubs, Sunday schools, children of the public schools, and elsewhere valued at \$17,000. These gifts were in money, toys, or articles useful in making presents to children. These were sent to England, France, Belgium, Germany, Serbia, Montenegro, Italy, Russia, and Poland. Among other things it sent, near the close of the year, a thousand pounds of candy in small packages and several thousand toys. One of the most interesting relief activities was that organized by the Vicomtesse de Rancogne for the relief aid of destitute artists of France and their families. Many prominent Americans were interested, their aid being distributed through the Appui aux Artistes of Paris. Similarly, Mr. Fritz Kreisler collected funds through concerts and sale of autographed photographs for the relief of destitute artists of all nationalities in Vienna.

There were various funds for the relief of special nationalities. The Serbian Relief Fund, of which Dr. Charles W. Eliot was chairman and Murray H. Coggeshall, 70 Fifth Avenue, treasurer, reached a total of \$187,128 at the close of the year. It made an especially strong appeal during the later months of the year because of the urgent need in Serbia. The National Committee for Syrian and Armenian Relief, with Charles R. Crane, 70 Fifth Avenue, as treasurer, reported a total of \$170,337. It received contributions through banks in the United States and Canada. The American-Armenian Relief Fund,

of which Brown Brothers and Co., 59 Wall Street, acted as treasurer, was also very active at the close of the year. The Polish Victims' Relief Fund, with ex-President Taft as honorary president and with headquarters at 33 West 42d Street, had received a total of \$205,555 before the close of the year. A subsidiary committee was collecting clothing and hospital supplies for Polish sufferers. The American Polish Relief Commission, with the Guarantee Trust Company of New York as treasurer, was sponsored by President Hibben of Princeton, President Butler of Columbia, Governor Capper of Kansas, ex-Senator Burton, and other distinguished Americans. The Polish pianist, Jan Paderewski, aroused the entire country to the urgency of the need for immediate and generous relief in Poland. The "Friends of Poland" fund, Roger Wolcott, 80 State Street, Boston, treasurer, reported a total of \$15,411. There were in addition the Montenegrin Fund; the Dardanelles Fund; the British-American War Relief Fund; the British War Relief Fund; and the Garibaldi Fund, all of which were generously supported by the American public. A unique effort to secure funds was the sale of *The Book of the Homeless*,

edited by Edith Wharton. The proceeds were to go to the American Hostels for Refugees and The Children of Flanders Rescue Committee. See also RED CROSS, THE AMERICAN NATIONAL.

RELIGION, BOOKS ON. See LITERATURE.

RELIGIOUS DENOMINATIONS AND MOVEMENTS. Statistics of the religious denominations in the United States and their possessions in 1915 were prepared by Dr. H. K. Carroll, associate secretary of the Federal Council of the Churches of Christ in America. The general results of his investigation are given in the table below. The statistics cover only the territory of the United States, the ministers, churches, and communicants of various denominations in foreign countries being deducted from the denominational totals. Where the official returns of denominations are obtainable, they are preferably used, and where such returns are not to be had, the best denominational sources of information are sought for approximate figures. In some cases the census returns for 1906 are the latest and only figures available. It is chiefly the very small religious bodies that report no statistics. Estimates, usually by statisticians of denominations, are given in a few cases

Denominations	Ministers	Summary for 1915		Net Gains for 1915	
		Churches	Communi- cants	Ministers	Churches
Adventists (6 bodies)	1,288	2,742	106,847	26	76
Baptists (15 bodies)	43,546	57,520	6,807,055	65	5
Brethren (Dunkards) (4 bodies)	3,554	1,260	123,844	121	d 29
Brethren (Plymouth) (4 bodies)	...	408	10,566	...	...
Brethren (River) (3 bodies)	234	105	4,908	...	...
Buddhists (2 bodies)	15	74	3,165	...	...
Catholic Apostolic (2 bodies)	33	24	4,927	...	...
Catholic (Eastern Orthodox) (7 bodies)	338	419	467,500	d 8	18
Catholic (Western) (3 bodies)	19,462	15,302	14,079,208	405	280
Christadelphians	...	70	1,500	...	...
Christians	1,066	1,360	113,887	...	...
Christian Catholic (Dowie)	85	17	5,865	...	...
Christian Union	360	320	16,800	6	18
Church of Christ Scientist	2,828	1,414	85,096	156	78
Churches of God (Winebrennarian)	440	498	28,650	20	4
Churches of the Living God (Colored)	101	68	4,286	...	...
Churches of the New Jerusalem (2 bodies)	147	151	9,718	4	4
Church Transcendent	2	8	144	2	8
Communitic Societies (2 bodies)	...	22	2,272	...	...
Congregationalists	5,923	6,108	771,862	...	15
Disciples of Christ (2 bodies)	8,261	11,143	1,522,821	...	...
Evangelical (2 bodies)	1,564	2,601	205,255	d 5	8
Faith Associations (9 bodies)	241	146	9,572	...	...
Free Christian Zion Church	20	15	1,835	...	...
Friends (4 bodies)	1,471	998	120,712	...	d 44
Friends of the Temple	8	8	876	...	...
German Evangelical Protestant	59	66	34,704	...	...
German Evangelical Synod	1,085	1,378	264,097	27	18
Jewish Congregations	1,084	1,769	143,000	...	...
Latter-Day Saints (2 bodies)	4,135	1,680	397,000	385	55
Lutherans (21 bodies)	9,688	15,269	2,434,184	238	d 951
Scandinavian Evangelical (8 bodies)	629	857	72,900	...	...
Mennonites (12 bodies)	1,476	760	61,381	63	24
Methodists (16 bodies)	42,088	62,728	7,472,108	168	314
Moravians (2 bodies)	149	147	21,146	2	4
Nonsectarian Bible Faith Churches	50	204	6,396	...	...
Pentecostal (2 bodies)	890	878	38,409	88	134
Presbyterians (12 bodies)	14,012	16,580	2,104,039	69	d 290
Protestant Episcopal (2 bodies)	5,621	8,141	1,051,696	d 8	139
Reformed (4 bodies)	2,155	2,782	502,602	d 22	12
Reformed Catholic	7	6	3,250	...	...
Salvation Army	2,961	941	27,664	53	37
Schwenkfelders	6	6	1,043	1	...
Social Brethren	15	17	1,262	...	...
Society for Ethical Culture	7	6	2,450	...	...
Spiritualists	...	2,100	200,000	...	...
Theosophical Society	...	154	4,714	...	...
Unitarians	512	469	70,542	d 12	d 6
United Brethren (2 bodies)	2,185	4,022	360,387	d 78	d 76
Universalists	656	768	55,000	...	...
Independent Congregations	267	879	48,673	...	...
Grand total in 1915	180,604	225,388	89,380,670	1,716	d 160
Grand total in 1914	178,888	225,493	88,727,078	8,810	1,321
d Decrease.					

for the increase of the year, where the official denominational reports are not ready. The alphabetical order of arrangement is followed, and classification is based on name or historical relation. The non-Christian bodies are few and easily separable from the Christian.

It is difficult for the average reader to get a clear idea of the true significance of the returns unless he understands the various principles of classification on which they are based. For instance, the Roman Catholic Church reports only "population," which includes with communicants the unconfirmed baptized; that is, children who have not been admitted to confirmation. The rule adopted in the census of 1890, and followed in that of 1906, deducts 15 per cent from Catholic population and sets down the remaining 85 per cent as communicants. Representatives of that church object to this method, but as the rule to report only members or communicants is applied to all other denominations, there is obviously no convenient way of making an exception in this case.

In like manner the returns of memberships of the great Methodist, Baptist, Lutheran, and Presbyterian denominations do not give an adequate idea of the population represented by those denominations. Moderate estimates of Methodist authorities, for example, place the denominational population at two and a half times the membership, which would amount to about 18,500,000. The number is rarely placed lower than 15,000,000 or 16,000,000 by the most conservative estimates.

The figures for Jewish members are misleading, since that denomination makes no public returns and nothing later than the figures gathered directly by circular from congregations by the government in the 1906 census is available. The census gives an even smaller number of members than this table, counting only heads of families, according to the Jewish rule. The number of adults connected with Jewish congregations must be more than 700,000. No official returns are made by certain small churches, including the Christian Catholic Church (Dowie) and the Catholic Apostolic Church. The Church of Christ Scientist has given no membership returns since 1907.

Changes in the totals for 1914 have been made, because in some cases the denominational returns were incorrect and were revised a year later by the same authorities. In other instances, estimates given in advance of regular returns needed to be slightly increased or decreased.

The total net gain of communicants for 1915 is 653,640, which is far lower than that of 1914, the decrease being more than 128,000, partly explained by a falling off among the Lutherans of nearly 11,000. It is probable that this is largely owing to defective returns; the same cause largely explains the decrease in Lutheran churches. Defective returns in 1915 for the Disciples of Christ, a vigorous and growing denomination, compelled the use of 1914 figures. The apparent loss of more than 11,000 members and 150 churches by the Cumberland Presbyterians is probably explained by more accurate returns. It is interesting to note that the grand total of churches shows a loss of over 150 as compared with 1914. The Southern Baptists have practically the same number of churches as in 1914, but have a gain of more than 116,000 in com-

municants. The apparent anomaly is largely accounted for by the closing or consolidation of rural churches. The general advance of the churches between 1890 and 1915 is distinctly encouraging. The total gains are as follows: 69,571 ministers, 60,037 churches, and 18,762,411 communicants, the gain in communicants being about 91 per cent. The table on preceding page gives the summary for 1915 with the net gain over the preceding year.

RELIGIOUS EDUCATION. See UNIVERSITIES AND COLLEGES.

REMEDIAL LOANS. See LOAN SHARKS.

REORGANIZED CHURCH OF JESUS CHRIST OF LATTER DAY SAINTS. This is a separate organization of Mormons claiming to be the true successor of the original church founded in 1830 by Joseph Smith. It was reorganized in 1852. In 1915 its membership numbered 73,899, with about 1000 ministers, 637 Sunday schools, and 33,062 Sunday school pupils. Its headquarters are at Lamoni, Iowa. Its chief officers are: Edmund L. Kelley, presiding bishop; Richard S. Salyards, general church secretary.

REPTILIA. See ZOOLOGY, *Reptilia*.

RESERVOIRS. See AQUEDUCT; DAMS; and IRRIGATION.

RÉUNION, or BOURBON. A French colony; an island in the Indian Ocean, covering 1980 square kilometers (764 square miles) and having (1911) 173,822 inhabitants. St. Paul (7 sq. km.), New Amsterdam (66), and Kerguelen (3414) are administratively attached to Réunion. Saint-Denis (26,689 inhabitants) is the capital. Imports and exports (1913), 24,934,943 and 16,592,290 francs respectively. Railways, 126 kilometers. Réunion sends a senator and two deputies to the French Legislature.

REVENUE, FEDERAL. See articles on various countries; on States of United States; and FINANCIAL REVIEW, section so entitled.

RHODE ISLAND. POPULATION. The population of the State, according to the State census, was, in 1915, 595,986. In 1910 the population was 542,610.

AGRICULTURE. The acreage, production, and value of the principal crops as estimated by the United States Department of Agriculture, in 1914-15, were as follows:

		Acreage	Prod. Bu.	Value
Corn	1915	12,000	516,000	\$516,000
	1914	11,000	462,000	458,000
Oats	1915	2,000	66,000	88,000
	1914	2,000	55,000	82,000
Potatoes	1915	5,000	550,000	506,000
	1914	5,000	825,000	578,000
Hay	1915	57,000	71,000	1,598,000
	1914	58,000	68,000	1,374,000

a Tons.

LIVE STOCK. The United States Department of Agriculture estimated that on Jan. 1, 1916, and Jan. 1, 1915, horses numbered 9000 and 10,000 valued at \$1,359,000 and \$1,460,000, milch cows numbered 22,000 and 23,000 valued at \$1,694,000 and \$1,633,000, other cattle numbered 10,000 and 11,000 valued at \$283,000 and \$295,000, sheep numbered 6000 and 7000 valued at \$35,000 and \$36,000, swine numbered 15,000 and 15,000 valued at \$165,000 and \$202,000. The production of wool in 1915 and 1914, was 30,000 and 25,000 pounds respectively.

TRANSPORTATION. The miles of steam railway operated in the State in 1914 were 466. The

New York, New Haven, and Hartford had of this 454 miles.

EDUCATION. The total school population of the State in 1915, ages 5 to 15, was 110,198. The total enrollment in the public schools was 86,505. The teachers numbered 2397. The total expenditures for school purposes were \$2,868,854.

FINANCE. The latest statistics available for the finances of the State are for 1913. There was a balance on January 1st of that year of \$68,020. The receipts for the period ending Jan. 1, 1914, amounted to \$3,459,251, and the payments to \$3,511,513, leaving a balance on Dec. 31, 1913, of \$15,458. The funded debt of the State on Jan. 1, 1914, was \$5,830,000, and the net debt was \$5,041,571.

CHARITIES AND CORRECTIONS. The charitable and correctional institutions of the State include the State Hospital for the Insane, House of Correction, the State Alms House, the State Prison, the Providence County Jail, Sockanosset School for Boys, and the Oaklawn School for Girls. The Rhode Island School for the Feeble-minded is under the State Board of Education.

POLITICS AND GOVERNMENT. The Federal Department of Justice on January 16th announced that reports of bribery and corruption alleged to have been practiced in the election of 1914 would be investigated, and such investigations were carried on during the year. The results had not been made public at its close.

STATE GOVERNMENT. Governor, R. Livingston Beekman; Lieutenant-Governor, Emery J. San Souci; Secretary of State, J. Frederick Parker; Attorney-General, Herbert A. Rice; Treasurer, Walter A. Read; Adjutant-General, Charles W. Abbott, Jr.; Auditor, Charles C. Gray; Commissioner of Public Schools, Walter E. Ranger; Commissioner of Insurance, Charles C. Gray—all Republicans.

JUDICIARY. Supreme Court: Chief Justice: Clarke H. Johnson; Associate Justices, C. Frank Parkhurst, W. B. Vincent, William H. Sweetland, Darius Baker; Clerk, B. S. Blaisdell.

STATE LEGISLATURE:

	<i>Senate</i>	<i>House</i>	<i>Joint Ballot</i>
Republicans	36	70	106
Democrats	8	30	38
Republican majority..	33	40	78

RHODESIA. A country (named for Cecil Rhodes) under the administration of the British South Africa Company; a British protectorate, which is divided into Northern Rhodesia (estimated area, 291,000 square miles; estimated population, 1,001,400) and Southern Rhodesia (148,575 square miles; 769,471 inhabitants).

NORTHERN RHODESIA includes the two former provinces of Barotseland, or Northwestern Rhodesia, and Northeastern Rhodesia. It was constituted a single British sphere in 1911. Le wanika, the native King, resides at Lealui; the administrator for the company resides at Livingstone.

SOUTHERN RHODESIA includes the provinces of Mashonaland (European population, 12,631), and Matabeleland (10,975). Chief towns: Salisbury (the capital), with 3479 white inhabitants, Umtali, and Victoria in Mashonaland; Bulawayo (5200 white inhabitants), Gwelo, and Selukwe in Matabeleland. The country is well

adapted to stock raising and agriculture. Gold has been mined in Rhodesia, supposedly from prehistoric times. From 1890, the date of the occupation by the South Africa Company, to September, 1898, the gold production was 6470 ounces; in 1902 the value of the yield (bullion) was estimated at £687,096; in 1905, £1,449,985; 1908 (fine gold), £2,526,007; 1911, £2,647,896; 1913, £2,903,267; 1914, £3,580,208. Coal mined in 1911, 212,529 tons; 1913, 243,328; 1914, 349,459. Silver, 187,641 ounces in 1911, 142,390 in 1913, 150,792 in 1914. Lead, 639 tons in 1911; copper, 1011 tons in 1914. Diamonds are found. Trade and financial statistics follow:

	<i>1907-8</i>	<i>1909-10</i>	<i>1910-11</i>	<i>1913-14</i>
Imports	£2,450,174	£2,214,014	£2,786,821	£3,018,204
Exports	2,474,236	3,178,416	3,199,956	3,505,157
Revenue	554,209	620,243	784,908	777,008
Expend.	543,597	614,405	684,688	886,475

* Trade for calendar, finance for fiscal years.

The total mileage of the Rhodesian railway systems (including the Beira line) was, at the end of 1914, 2468. Through connection exists between Cape Town and the Congo border, a total distance of 2149 miles; and between Cape Town to Beira, over 2000 miles. Branches extend to the mining districts and to the burial-place of Cecil Rhodes in the Matopos. The railway has been extended beyond the Rhodesian border 163 miles to Elisabethville in the Belgian Congo.

RICE. Estimates on rice production in 1915 were available for but a few countries. The Japanese crop was estimated at 493,570,000 bushels and the Italian crop at 25,970,000 bushels. Japan was overstocked with rice in the fall of 1915, and efforts were made to export 10,000,000 bushels, the surplus on hand. The annual consumption of the country is about 275,000,000 bushels. In Italy rice is after wheat the most important cereal for consumption, but a surplus is produced and prepared rice in quantities equivalent to 2,450,000 bushels on the average is exported annually. The United States, according to estimates by the Department of Agriculture, produced 28,947,000 bushels on 803,000 acres, the rate of yield being 36.1 bushels per acre. The total production had never before been equaled, but the acreage was surpassed by 24,000 acres in 1913. The average yield per acre, 36.1 bushels, also constituted a record. The total value of the crop, based on the farm value of 90.6 cents per bushel on December 1st, of the year, amounted to \$26,212,000, the highest in the history of American rice culture. As in previous years the principal rice growing States were Louisiana, Texas, Arkansas, California, and South Carolina, given in the decreasing order of production. In California the industry has made rapid strides since 1912 when the first commercial crop was grown on about 1400 acres. The production is confined to the Sacramento and San Joaquin valleys. The average yield per acre in California has thus far been much above that of any other State.

RICHARDS, THEODORE WILLIAM. American scientist and educator, who received in 1915 the Nobel Prize for chemistry for 1914. He was born in Germantown, Pa., in 1868, and was educated at Haverford College and Harvard University. He studied abroad for several years, and was appointed assistant professor of chemistry in 1894, and full professor in 1901. In

1907 he served as Harvard exchange professor at Berlin. His chief contribution to science has been the revision of the atomic weights of the elements of oxygen, nitrogen, chlorine, lithium, barium, calcium, strontium, potassium, iron, zinc, nickel, copper, silver, magnesia, and uranium. He is a member of the International Commission of Atomic Weights. In 1910 he was awarded the Davey Medal by the Royal Society of England, and in 1912 the Willard Gibbs Medal of the American Medical Society. He is a member of many scientific societies in the United States and Europe, and received honorary degrees from Yale, Haverford, Harvard, Cambridge, and Christiania.

RIDDER, HERMAN. American editor, died Nov. 1, 1915. He was born in New York City in 1851 and was educated in the public schools. At 11 years of age he began business life as an errand boy. While still a mere youth he went to work in a Wall Street office, where he remained two years. During the next 14 years he was employed as an insurance agent, and having acquired a considerable sum of money decided to enter the newspaper business. He founded first the *Katholisches Volksblatt* in 1878. Eight years later he started another paper, the *Catholic News*, and in a comparatively short time he had made his second venture one of the leading organs of the Catholic Church in this country. In 1890 he purchased a considerable portion of stock of the New York *Staats-Zeitung*, then controlled by Oswald Ottendorfer. He became successively director, treasurer, and manager of this newspaper. He later rose to control the paper as chief owner of its stock. His position and influence among the German-Americans early made him a leader. His first appearance in politics was in 1893, when he organized the German-American Reform Union, which supported William L. Strong for mayor of New York. Through the columns of his paper and in his speeches Mr. Ridder was an advocate of tariff reform and, although nominally a Democrat, was an independent in politics. He supported Mr. Cleveland in 1884, but in 1896 and in 1900 supported McKinley. In 1904 he returned to the Democratic party, and also supported Bryan in 1908. At the outbreak of the great war in Europe Mr. Ridder began in his paper a campaign in advocacy of the German cause. He daily published editorials in English under his own signature in which he bitterly criticised whatever policies or utterances seemed pointed against Germany. He was severely criticised for this course, but continued it to the end of his life. Mr. Ridder was conspicuous in charitable and church work, and was a member of the Metropolitan Museum of Art, and the American Natural History Society. He was perhaps the most conspicuous American of German parentage in the United States.

RITTMAN PROCESS. See CHEMISTRY, INDUSTRIAL.

RO. See INTERNATIONAL LANGUAGE.

ROADS AND PAVEMENTS. In pavement construction a notable feature of the year was the laying of brick directly on the concrete foundation without an intermediate sand cushion. The wisdom of this method was rather warmly discussed in the technical press. There seemed to be general approval by those who had had direct personal experience with the method, but a longer trial is needed before a balance can

be struck between its advantages and disadvantages. Improved highway or road construction goes on apace. Nearly every State in the Union and the counties of many States as well are engaged in road building on a large scale. For the whole United States it is estimated that about \$265,000,000 had been expended by one State alone for better roads, either directly or as State aid. To this sum local authorities have added large amounts, ranging from 100 per cent of the State expenditure downward in the various States. State aid to systematic road improvement began in New Jersey, where the first actual payment was made at the close of 1892, although the first State aid law was passed by the New Jersey Legislature in 1891. Massachusetts was only a year behind in creating a legislative committee to investigate the subject of road improvement, and that State made its first road improvement appropriation in 1894. To the close of 1915 New Jersey had expended about \$8,500,000, and Massachusetts some \$19,000,000 in road improvement. The third State in the road list was Vermont, which made a start in 1894, and to the close of 1915 had expended about \$3,500,000 for roads. In round numbers the road expenditures of some of the other States to the end of 1915 had been as follows: New York, \$97,000,000; Pennsylvania, \$27,000,000; Connecticut, \$16,000,000; California, \$15,000,000; Washington, \$10,000,000; Ohio, \$8,500,000; Maine, \$8,000,000. The Office of Public Roads, United States Department of Agriculture, which has been collecting and disseminating road information since 1893, and later on has been building experimental roads and conducting a laboratory, was consolidated with other offices and bureaus in 1915 to form the Office of Public Roads and Rural Engineering.

ROBERTSON, MORGAN. An American writer, died March 24, 1915. He was born in Oswego, N. Y., in 1861, and was educated in the public schools of New York City, and at Cooper Institute. At the age of 16 he went to sea and made two trips around the world. After following the sea for 10 years and filling nearly every possible job on ship board, he was for eight years engaged in watch making and diamond setting. He became an expert in the latter trade. In 1894 his sight failed, and he was forced to give up this occupation. In 1896, while he was in New York City, he read one of Rudyard Kipling's sea stories. This inspired him to write and in one night he finished his first short story. After several rejections this was accepted by a magazine. During the year which followed he wrote and sold about 20 short stories of the sea. He continued to write for many years. His sea stories contain much vivid and dramatic writing. In addition to his other accomplishments Mr. Robertson was an inventor. He devised in 1905 a periscope for submarines. Among his best known works are: *Tale of a Halo*; *Spun Yarns*; *Futility*; *Where Angels Fear to Tread*; *Masters of Men*; *Shipmates*; *Sinful Peck*; *Down to the Sea*; and *Land Ho*.

ROBINSON, EDWARD VAN DYKE. American economist and educator, died Dec. 10, 1915. He was born in Bloomington, Ill., in 1867, and was educated in the University of Michigan. He studied afterwards in the University of Leipzig, where he received the degree of Ph.D. After teaching for several years in Western colleges he became professor of economics in the University

of Minnesota in 1907. He held this position until the summer of 1915 when he was appointed professor of economics at Columbia University. He was a member of many economic societies. He was a prolific writer and among his published works are *Nature of the Federal States*; *War and Economics*; *Text Book of Commercial Geography*; and the *Cost of Government, National, State, and Local*.

ROBINSON, EDWIN A. See LITERATURE, ENGLISH AND AMERICAN, *Poetry*.

ROCKEFELLER FOUNDATION. See INDUSTRIAL RELATIONS COMMISSION; and RELIEF FOR WAR VICTIMS, *Belgian Relief Fund*.

ROCKEFELLER INDUSTRIAL REPRESENTATION PLAN. See ARBITRATION AND CONCILIATION, *Rockefeller Plan*.

ROCK ISLAND RAILROAD. See RAILWAYS.

ROCKS. See GEOLOGY.

ROCKY MOUNTAIN SPOTTED FEVER, or TICK FEVER. Several scattered cases of this disease were reported during the year. The secretary of the Colorado State Board of Health announced that up to May 15, 18 cases had been reported in the State. Tick fever has been especially prevalent in the Bitter Root Valley in previous years. It is now occurring in other localities. Ticks are said to be more plentiful than ever.

Since 1902 Rocky Mountain spotted fever has prevailed in certain localities in the Western States, and Ricketts and his associates gave a definite knowledge as to the means by which the disease is spread from person to person and place to place. A recent paper by Fricks (in the *United States Public Health Reports*, Jan. 15, 1915) states that the disease is present in nine Rocky Mountains and Coast States, these localities harboring infective wood-ticks which transmit the fever to human beings by their bites. Except for the Snake River Valley, Idaho, and the Great Basin region, the infected areas are rather small and definitely outlined, but it is probable that with the opening up of new localities, other areas of infection may be found. Under ordinary conditions wood-ticks remain near the place where they are hatched and their period of infection is not longer than two weeks, so that there is little danger of their spreading the disease in the way that rats spread bubonic plague. If the ticks migrate they do so when attached to their animal host, either domestic or wild, and the distribution of the areas along the water courses in the Northwest seems to indicate this as the method by which infection was spread by such large animals as deer, elk, buffalo, and range cattle. To some extent also the shipment by rail of elk and cattle may help to spread the disease. Fricks's report points out the value of sheep grazing as a means of eradicating ticks. He believes that close grazing tends to destroy the ticks, that ticks, principally by tangling themselves in the wool of the sheep, are destroyed, that the removal of other animals, domestic and wild, which serve as hosts for adult ticks, serve a good purpose, and finally the eradication of ticks is placed on an economic basis. Experiments were made with two bands of sheep numbering 1500, and lasted from April to July when the sheep were sheared. The animals were searched for dead and live ticks, and it was estimated that over 25,000 were destroyed during this period.

ROENTGEN RAYS. It is well known that X-ray has a remarkable influence upon the thymus gland. This gland normally atrophies early in childhood, but persists in many patients with detriment to health and sometimes to life. Kocher states that nearly 50 per cent of exophthalmic goiter have either an enlarged thymus or one that has not undergone involution, and he suggests that these patients be prepared for operation on the thyroid by irradiation of the thymus. Children suffering from thymic asthma have been relieved of their symptoms and the thymus gland reduced in size by this treatment. The action of the rays is very rapid. Regaud and Cremieu have shown experimentally, that it was possible to reduce the thymus of young cats with a dose of 14 Holznecht units as early as the second day after irradiation, this reduction being due to necrobiosis and absorption of the thymus lymph nodes. Regeneration began about the 15th day in the lymphocytes that remained intact. They found also that the thymus could be entirely destroyed with one irradiation of 50 Holznecht units. Waters reports the results of 60 cases of exophthalmic goiter treated by this method. Six treatments were given in each series, over the anterior chest wall, starting in the first interspace on the right side close to the sternal margin, through a portal of entry 5 cm. in diameter. Irradiations were given in the majority of cases on six successive days in the first, second, and third intercostal interspaces along the right and left sternal margin; however, a number of the patients received six treatments at one séance. The patients were then allowed to wait until two weeks had elapsed after the last treatment before beginning the second series of irradiations. They were again treated in the same manner as before and a like interval of time allowed before receiving the third or final series. Therefore, no cases have received more than three series, or 18 treatments, and some only one and two series, comprising 6 and 12 treatments, respectively. Waters holds that Roentgenization will cure, temporarily at least, some cases of Graves's disease and moreover it will effect an apparent cure in some cases when all other measures have failed. Under a strict and rigid technic no bad effects are observed. The changes in the blood picture were marked and were characterized principally by an increase in the neutrophilic element and a decrease in the small mononuclear lymphocytes. The exophthalmic goiter offers the greatest resistance, but 5 cases of 60 treated showed marked improvement. The pulse rate was lowered, the nervous balance and general health being first to show improvement. See THORIUM.

ROMAN CATHOLIC CHURCH. The great war affected the progress and the ordinary orderly details of church administration continually during the year. Not only was direct intercourse of the many dioceses throughout the world with the Vatican seriously impeded, but the missions suffered materially. The funds for their support usually collected in the warring countries stopped, and in many instances the missionaries themselves had to return to take part in the conflict. Pope Benedict XV was unrelenting in his efforts to restore peace and in his letters and public addresses constantly counseled against, as he expressed it in his allocution to the Consistory of December 6th, the

first of his pontificate: "the continuation of this shedding of blood, which, if prolonged, might mean the beginning of decadence for Europe." One of his most important acts was the *Motu Proprio* of November 4th, establishing the new Sacred Congregation of Cardinals and their assistants, who will have supervision of all Catholic seminaries and universities.

At the Consistory on December 6th, Pope Benedict created the following cardinals: Julius Tonti, Apostolic Nuncio of Portugal; Alphonsus Mistrangelo, Archbishop of Florence; John Cagliere, Delegate Apostolic of Central America; Andrew Fruehwirth, Apostolic Nuncio of Bavaria; Raphael Scapinelli di Leguigno, Apostolic Nuncio of Austria-Hungary; George Gusmini, Archbishop of Bologna. This brought the membership of the Sacred College up to 60, divided as to nationality as follows: Italian, 30; French, 6; Spanish, 5; Austro-Hungarian, 5; American, 3; German, 2; English, 2; Portuguese, 2; Irish, Canadian, Brazilian, Dutch, and Belgian, 1 each. The two senior members are Cardinal Neto and Cardinal Gibbons, who have been serving for 31 and 29 years, respectively. The youngest member is Cardinal Merry del Val, who is 51; six have passed their 80th year. There are 10 vacancies, and of the present membership 16 cardinals were created by Leo XIII; 38 by Pius X; and 6 by the reigning Pope Benedict XV. During his reign 10 cardinals have died.

The list of the hierarchy of the Catholic world shows there are now 846 residential and 459 titular sees; 22 abbasies; 13 delegates apostolic; 154 vicariates apostolic; and 65 prefectures apostolic. During 1915 the hierarchy was increased by 3 new ecclesiastical provinces—1 in Canada, and 2 in Brazil—and 3 new dioceses, also in Brazil. Eleven sees were restored, several of them having historical importance.

The death list of notable prelates for the year is unusually large, including 9 cardinals and 9 members of the hierarchy of the United States. The cardinals were: Agliardi, Bauer, Cavallari, Di Pietro, Dubillard, Lorenzelli, Tecchi, Vaszary, and Serafino Vannutelli. The American prelates were: Archbishop Quigley of Chicago; Bishops Colton, Buffalo; Conaty, Los Angeles; Burke, Albany; Fox, Green Bay; Kozlowski, auxiliary of Milwaukee; Maes, Covington; Scanlan, Salt Lake; and Stariha, retired, Lead, S. D. Archbishop Langevein of St. Boniface, Canada, Bishop F. Abati, O. S. F., an Italian, the oldest Catholic bishop in the world, aged 95 years, and Abbot Don Anacleto Salazar, a Spaniard, who had been a priest 80 years and was 104 years old, were also numbered with the year's dead.

Changes among the hierarchy of the United States were occasioned by the following appointments: Rt. Rev. George William Mundelein, auxiliary bishop of Brooklyn, to be Archbishop of Chicago; Very Rev. Dr. Joseph S. Glass, C. M., of Los Angeles, Cal., to be Bishop of Salt Lake; Bishop Joseph F. Busch changed from Lead, S. D., to St. Cloud, Minn.; Very Rev. M. J. Gallagher to be auxiliary bishop of Grand Rapids, Mich.; Mgr. Thomas F. Doran to be auxiliary bishop of Providence, R. I.; the Rev. A. J. Schuler, S. J., to be Bishop of El Paso, Texas; Mgr. Ferdinand Brossart, V. G., to be Bishop of Covington, Ky.; Bishop Dennis J. Dougherty of Jaro, P. I., transferred to Buffalo, N. Y.; Rt. Rev. Dr. P. J. Hurth was made Bishop of Nueva Segovia, P. I.; and Rt. Rev. Joseph Petrelli was

appointed titular Archbishop of Nisibi and Apostolic Delegate to the Philippines. Bishop Thomas F. Kennedy, rector of the American College, Rome, was promoted to the titular archbishopric of Seleucia. Mgr. Edward P. Roche was appointed Archbishop of St. John's, Newfoundland. Three new archdioceses were established in Canada: Winnipeg, with Mgr. Sinnott as the first incumbent; St. Boniface, with Mgr. Beliveau; and Regina, with Mgr. Mathieu, respectively, as archbishops.

The Very Rev. Vladimir Ledochowski, an Austrian Pole, was elected on February 17th, at Rome, Father General of the Society of Jesus. Fifteen American Jesuits attended as delegates the General Congregation at which he was chosen. The Congregation also determined to establish the office of an American Assistant-General, and the Rev. Thomas J. Gannon of New York was elected the first occupant of the new office. Four American Jesuits were sent to India to replace the German members of the order who had been interned there on account of the war.

The executive machinery of the great lay charity organization, the St. Vincent de Paul Society in the United States, was reorganized by a unification of its different branches, at a conference in Washington, November 22nd-23rd, and a National Council with headquarters in Washington formed, with Thomas M. Mulry as president. The subordinate councils are St. Louis, New Orleans, Philadelphia, Chicago, New York, Boston, and Brooklyn. Other important national conventions during the year were: Indian Congress in South Dakota, August 7th, 8th, and 9th; third convention of Knights l'Epee (deaf mutes) at Buffalo, August 2nd to August 7th; national convention of the Knights of Columbus at Seattle, August 3rd-7th; the Central Verein convention at St. Paul, August 8th-12th; 41st convention Catholic Y. M. National Union at Pittsburgh, August 7th-8th; 45th annual convention of the Catholic Total Abstinence Union of America, at Pittsburgh, August 8th-11th; Federation of Catholic Societies annual convention, at Toledo, August 15th-18th; international convention of the Catholic Order of Foresters, at Providence, R. I., August 17th-21st; and International Federation of Catholic Alumnae, at Chicago, November 26th-28th.

STATISTICS. The *Official Catholic Directory* for 1915 states that there are 16,309,310 Catholics in the United States, and comparing these figures with those in the directory for 1905, an increase of 3,846,517 is shown. In 20 years the increase has been 7,231,445. There are 14,008 priests, with 14,961 churches. In the 85 seminaries 6770 young men are studying for the priesthood, and in the 5488 parish schools there are 1,456,206 pupils. There are 229 colleges for boys and 680 academies for girls; 284 orphan asylums with 45,742 inmates. The hierarchy of the United States is made up of 17 archbishops, 3 of whom are cardinals, and 102 bishops. The 30 States having the largest number of Catholics are: New York, 2,885,824; Pennsylvania, 1,756,763; Illinois, 1,473,379; Massachusetts, 1,392,000; Ohio, 793,179; Louisiana, 586,200; New Jersey, 585,000; Michigan, 581,000; Wisconsin, 576,470; Missouri, 490,000; California, 469,480; Minnesota, 465,900; Connecticut, 441,193; Texas, 318,576; Iowa, 279,160; Rhode Island, 275,000; Maryland, 261,000; Indiana, 245,141; Kentucky, 170,609; New Mexico, 140,573; Kansas, 132,701;

Maine, 131,638; New Hampshire, 130,081; Nebraska, 123,403; Colorado, 108,331; North Dakota, 103,371; Washington, 93,760; Vermont, 82,878; Montana, 70,000; Oregon, 66,450.

ROMANCE LANGUAGES. See **PHILOLOGY, MODERN.**

ROPES, CHARLES JOSEPH HARDY. American theologian, died Jan. 5, 1915. He was born in Petrograd, Russia, where his father was United States Consul, in 1851, and studied in Germany and France. In 1872 he graduated from Yale. After postgraduate studies at the University of Tübingen he entered the Andover Theological Seminary, graduating in 1875. He was ordained to the Congregationalist ministry in 1877. In the same year he became pastor at Ellsworth, Me. He was appointed, in 1881, professor of New Testament language and literature in the Bangor Theological Seminary. From 1887 to 1901 and from 1905 until his death he was librarian of that seminary. He was the author of *Morality of the Greeks* (1872), and contributed many articles to theological journals.

ROTHSCHILD, NATHAN MAYER, first Baron. A British banker, son of Lionel Rothschild. He was born in London on Nov. 8, 1840, and died on March 3, 1915. He succeeded to his uncle's baronetcy in 1876, and to his father's title as an Austrian baron in 1879. He served as a Liberal Member of Parliament from 1865 to 1885, when he was made a peer. He was the first professing Jew—Disraeli was a Jew by race but not by faith—to sit in Parliament and to receive a peerage. After 1889 he was Lord Lieutenant of Buckinghamshire. A public spirited citizen, he was not only active in promoting Jewish interests in every quarter, but also contributed liberally to public movements of all sorts. He refused loans to Russia on account of the treatment of Jews in that country. During the European war he served as president of the British Red Cross, which under his direction raised nearly \$7,000,000, and his exertions in this connection were considered to have hastened his death. Frequently consulted by British statesmen, he aided Disraeli in obtaining possession of the Suez Canal for Great Britain. He was president of the United Synagogue of London, and received the honorary degree of LL.D. from Cambridge University. At the time of his death the family fortune of the Rothschilds amounted to about \$2,000,000,000. His son, Lionel Walter (born 1868), succeeded to his title.

ROWING. Rowing as a world sport was discontinued in 1915 as the result of the European war. For the first time in the history of the pastime the English Henley had to be postponed. In the United States, however, the oarsmen had a busy season, James A. Pilkington, president of the National Association of Amateur Oarsmen, maintaining that more young men manned the sweeps and sculls in open competition in 1915 than in several years past.

College oarsmen naturally held the centre of the stage, the annual regatta on the Hudson River at Poughkeepsie attracting the greatest interest, followed closely by the Yale-Harvard races on the Thames at New London, Conn.

Cornell, under the coaching of the veteran Courtney, again took its place at the top by winning the varsity and junior eight-oared contests on the Hudson. Yale repeated its success of 1914 by administering a crushing defeat to Harvard.

A notable feature of the Poughkeepsie regatta was the excellent showing made by the Leland Stanford crew in the 'varsity event. The oarsmen from the Pacific Coast put up a gallant battle for first honors and the Ithacans managed to finish in front by a margin of only a few feet.

The times made by the various eight-oared varsity crews on the Hudson were: Cornell, 19 minutes, 36% seconds; Leland Stanford, 19:37%; Syracuse, 19:43%; Columbia, 20; Pennsylvania, 20:10%. The record for the course, 18:53%, was made by Cornell in 1901.

Cornell also won the junior eight-oared event in 10 minutes 1/4 second. The times for the other crews were: Pennsylvania, 10:05; Columbia, 10:07%.

The freshman eight-oared race was captured by Syracuse, whose time was 9 minutes, 29% seconds. The other crews finished as follows: Cornell, 9:43; Columbia, 9:47%; Pennsylvania, 10:01%.

Yale had an easy task in defeating the Harvard varsity at New London, crossing the finish line some six lengths in the van. Yale's time was 20:52 and Harvard's, 21:13%.

The second varsity eight-oared event also went to Yale, whose time was 10:40. Harvard's time was 10:43. The freshman race was somewhat marred by darkness, the distance being necessarily reduced to one and a half miles. Here again Yale was the victor, its time being 8:06. Harvard's time was 8:10.

In college dual and triangular regattas Yale defeated Pennsylvania; Yale defeated Cornell and Princeton; Harvard defeated Cornell; Harvard defeated United States Naval Academy; Princeton defeated Columbia; Princeton defeated United States Naval Academy; Leland Stanford defeated University of Washington and University of California.

The 43rd annual championships of the National Association of Amateur Oarsmen were contested on the Connecticut River at Springfield, Mass., the Duluth Boat Club of Minnesota carrying off most of the laurels.

The winners in the more important events were: Junior eight-oared shells, Duluth Boat Club; intermediate four-oared shells, Duluth Boat Club; senior four-oared shells, Duluth Boat Club; senior international four-oared shells, Duluth Boat Club; intermediate eight-oared shells, Duluth Boat Club; senior quarter-mile dash (single sculls), Walter M. Hoover, Duluth Boat Club; intermediate single sculls, Henry Heller, Metropolitan Rowing Club, New York; association single sculls, G. Waldo Smith, New York A. C.

Robert Dibble of the Don Rowing Club of Toronto retained his title in the diamond sculls by defeating J. B. Kelly of the Vesper Boat Club of Philadelphia.

The 12th annual regatta of the American Rowing Association, popularly known as the American Henley, was held on the Schuylkill River. The winners of the principal events were: First eight-oared shells, University of Pennsylvania junior crew; special four-oared shells, Undine Barge Club, Philadelphia; freshmen eight-oared shells, Syracuse University; junior collegiate eight-oared shells, University of Pennsylvania. J. B. Kelly of the Vesper Boat Club again won the first single sculls.

RUBBER. The rubber industry in 1915, as regards both the production of the raw ma-

terial and its manufacture into finished products, decidedly felt the influence of war conditions, especially in the United States. The relation of rubber to war was so important that early it was made contraband, and in 1914 Great Britain laid embargoes on exports from its various colonies, particularly Ceylon, and Malaysia, where large quantities of plantation rubber are shipped, and a large portion of which comes to America. Rubber naturally figured extensively in war munitions and supplies, not only for automobile and truck tires which were required in large numbers, both for the new vehicles that were manufactured for military purposes and also for replacements. In the second place, life in the trenches required vast numbers of hip and other rubber boots, rubber clothing, and as typical of this, orders for 2,000,000 hip boots and for 1,000,000 waterproof capes were issued during the year by the British government. Rubber ground sheets or blankets were required literally by the million by the combating forces, while in the hospitals rubber sheeting, air cushions, hot water bottles, drainage tubes, and other surgical appliances were in demand. Of these supplies, a large amount came from the United States, although the Allies refused to allow the shipment to Germany and Austria of rubber goods. In addition to the war demands in America the automobile industry was active, and in 1915 some 2,400,000 cars were in use in the United States, and possibly some 714,000 elsewhere in the world outside the United States. It was estimated that the American production of cars would increase from 892,000 in 1915 to 1,200,000 in 1916, so that for these 3,400,000 motor vehicles which require an average of five casings and five tubes each, there would be required some 71,400 tons of crude rubber for tires, while for the 714,000 motor vehicles outside of the United States there would be needed some 17,243 tons of crude rubber for the same purpose, so that almost 89,000 tons of rubber would be required for tires. This would be obtained from a world's production of crude rubber in 1915 estimated at 146,000 tons, so it will be apparent that for other purposes there would be a shortage and increased prices, the latter being the tendency at the end of the year.

CRUDE RUBBER. Considering the crude rubber production and market during 1915, especially as it concerned the United States and Canada, which took over one-half the world's product, the first point to be observed was the lifting of the embargo on January 8th, so that American manufacturers by giving special guarantees to the British government could receive crude rubber, and the first supply on this basis was 200 tons, reaching New York on the *Lusitania* January 23rd, which was followed by other large shipments. This policy and steady shipments from Brazil kept the rubber market steady during the first part of the year and increased supplies came, which the Rubber Club of America, Inc., agreed to handle and release under the usual guarantees. In June further arrangements were made whereby American manufacturers could receive supplies of plantation rubber consigned to the local British consul, and then passed upon by the Rubber Club. Later in the year the closing of the Panama and Suez canals and the activity of the Teutonic submarines in the Mediterranean increased prices, and in December the British steamer *Langton Hall* was sunk in the

Mediterranean, having in its cargo 500 tons of rubber. It was also reported that ships from the Far East with rubber cargoes had been directed to sail around the Cape of Good Hope. As a result at the end of the year plantation rubber sold for \$1 a pound, which it had reached from a low point of some 57 cents in February. The average prices at New York for rubber over a period of six years were as follows:

	Upriver		Islands		Cameta
	Fine	Coarse	Fine	Coarse	
1915	\$.061%	\$.047%	\$.055%	\$.030%	\$.033%
1914	.. .73%	.. .47%	.. .63%	.. .31%	.. .35%
1913	.. .87%	.. .58%	.. .79%	.. .36%	.. .42%
1912	.. 1.11%	.. .89%	.. 1.05%	.. .59%	.. .68%
1911	.. 1.18%	.. .95%	.. 1.10%	.. .64%	.. .70%
1910	.. 2.01%	.. 1.36%	.. 1.89%	.. .90%	.. 1.00%

The imports of crude rubber in the United States and Canada during 1915 were as follows: Paras, 26,300 tons; plantation, 58,127 tons; Africans, 2700 tons; miscellaneous, 8670 tons; or a total of 95,797 tons. The exports amounted to 2348 tons, so that there was retained in North America 93,449 tons. The value of rubber shipped to the United States in 1915 was estimated at \$80,000,000. The world's production of crude rubber was estimated at the end of the year by competent British authorities as follows:

	Tons		
	1915	1914	1913
Ceylon and India	20,600	14,800	11,830
Malaya, etc.	72,800	49,700	86,200
Amazonas (Brasil, Bolivia, and Peru)	80,700	28,345	29,880
Peruvian and Cacho	6,800	8,655	9,620
West Coast, Africa	2,500	8,650	8,900
Benguela and Mossamedes	1,900	1,500	1,300
Loanda	600	450	400
Congo, French Congo, and Sudan	3,000	3,900	4,400
From other sources	7,100	10,880	11,410
Totals	146,000	120,380	108,440

It will be noted that there were increases in all sources of supply except for wild rubber, especially that known as Peruvian and Cacho, and that from the west coast of Africa and other parts of Africa. In other words, during the year there was a decrease in wild rubber and a considerable increase in plantation rubber, and an estimate of the acreage of plantations in the Far East and Africa indicated that in 1915 1,345,000 acres were planted, as compared with 1,245,000 in 1914. The exports of plantation rubber from the Federated Malay States for the year 1914 was 44,524 tons, as compared with 30,697 in 1913, an increase from 2641 tons in 1909. In December, 1915, the greatest monthly production on record was shipped, namely, 5111 tons. The annual receipts and shipments at Para during the years 1913 to 1915 are given herewith, and are also of interest in this connection:

	Tons		
	1913	1914	1915
Receipts of Pará	29,750	28,170	30,595
Receipts of Peruvian	9,620	8,655	6,800
Shipments of Pará and Peruvian to Europe	22,110	15,985	14,440
Shipments of Pará and Peruvian to America	17,050	21,690	29,960

ARTIFICIAL RUBBER. In rubber technology chemists were at work, and it was reported from

Petrograd that artificial rubber could be made from vodka, according to a process invented by a chemist named Ostromyslensky. In the United States a patent was also granted for obtaining rubberlike substances from alcohol.

Another feature of the year was the increase in the prices of chemicals and compounding ingredients used in rubber manufacture, due to the stoppage of foreign supplies to the United States. See CHEMISTRY, INDUSTRIAL.

ESTIMATED WORLD'S CONSUMPTION OF RUBBER

	Tons		
	1913	1914	1915
England	18,000	18,000	24,000
Germany, Austria, etc.	16,600	16,430	8,000
France	9,000	5,000	7,000
Russia	11,500	11,610	16,000
Italy, etc.	1,370	4,000	2,500
Japan and Australia	2,000	2,400	4,000
America and Canada	47,200	62,940	89,500
Totals	105,670	120,380	146,000

BUCKER, SIR ARTHUR WILLIAM. English scientist, died Nov. 1, 1915. He was born in 1848, and was educated at Brasenose College, Oxford. He was a fellow of this college from 1871-76. In 1874 he was appointed professor of mathematics and physics at Yorks College. From 1886-1901 he was professor of physics at the Royal College of Science in London. He was the principal of the University of London from 1901-08. He was knighted in 1902. In 1906 he was a member of the Royal Commission on Irish Universities. He was also a member of other important commissions, including the Carnegie Trust Fund for the Universities of Scotland, and the Royal Commission of the 1851 Exhibition, 1911. His published writings on scientific subjects include: *On the Expansion of Sea Water by Heat* (with Sir E. Thorpe, 1876); and *Magnetic Survey of the British Isles for Epochs, 1886 and 1891*.

RUM. See LIQUORS.

RUMANIA. A European constitutional monarchy, bordering on the Black Sea. It includes the former principalities of Moldavia and Wallachia, with the territory of the Dobruja. The country is separated from Hungary by the Carpathian Mountains and the Transylvanian Alps, in part by the Danube River from Bulgaria, by the Pruth from Russia. The capital is Bucharest.

AREA AND POPULATION. The area of Rumania is stated at 137,902 square kilometers (53,244 square miles). This includes the area of the territory acquired from Bulgaria by the Treaty of Bucharest (Aug. 7, 1913), 7725 square kilometers (2983 square miles); this territory now forms two districts, Caliaera and Durostor. The kingdom is slightly smaller than the State of Arkansas, the area of which is 53,335 square miles.

In the table below are given the area and population of the districts which compose the kingdom, according to corrected figures for the census of Jan. 1, 1913 (Dec. 19, 1912), as compared with the returns for 1899; together with the density in 1913:

	Sq. km.	1899	1913	D.
Argeesh	4,216	207,605	242,917	58
Bacau	4,410	195,194	232,954	53
Botoshani	3,077	171,487	197,404	64
Braila	4,286	145,284	181,583	42

	Sq. km.	1899	1913	D.
Buzau	4,926	221,268	277,977	56
Callacra	7,725	.....	{ 143,355 {	35
Durostor } .....	.....	.....	{ 180,735 {	.....
Constantza	6,910	141,056	209,571	30
Covurlui	2,662	143,784	171,799	64
Dambovitza	3,440	211,666	258,378	75
Dolj	6,538	285,579	436,449	67
Dorohoi	2,846	159,461	184,382	65
Falciu	2,120	98,831	108,896	51
Gorj	4,579	171,800	800,871	44
Ialomita	7,095	187,889	242,848	84
Iasi	8,227	192,581	212,669	66
Ilfow	5,176	541,180	681,759	132
Mehedintai	5,820	249,688	295,474	56
Muscel	8,058	115,180	135,216	44
Neamtzu	8,977	149,711	169,849	43
Olt	2,863	143,843	171,086	60
Prahova	5,040	307,302	389,914	77
Putna	3,840	151,249	181,382	54
Ramnicu-Sarat	3,324	136,918	168,937	49
Roman	1,880	111,588	128,165	68
Romanatzi	3,560	208,773	248,600	70
Suceava	3,853	131,596	151,147	45
Teruci	2,408	121,179	142,384	59
Teleorman	4,577	238,628	297,470	65
Tulcea	8,626	126,752	170,859	20
Tutova	2,498	116,377	129,819	57
Vaslui	2,260	110,184	128,804	57
Valcea	4,081	190,903	232,011	57
Vlascha	4,494	202,759	259,395	58
Total	137,902	5,956,690	7,509,009	54

Marriages, 1914, 65,325 (74,542 in 1911); births, 327,345 (299,870); deaths, 182,949 (179,076); stillbirths (not included in the foregoing), 8784 (8144); excess of births over deaths, 144,397 (120,794). Population (1914) of Bucharest, 345,628 (295,213 in 1911); Jassy (Iasi), 76,120 (79,680); Galatz, 72,512 (66,507); Braila, 65,911 (60,901); Ploesti, 57,376 (49,256); Craiova, 51,877 (45,780); Botoshani, 32,874; Buzau, 29,483; Constantza, 27,662; Berlad, 25,367.

EDUCATION. In spite of progress, educational facilities remain inadequate. Primary instruction is technically compulsory between the ages of 7 and 14. Although improvement has been made, nearly 60 per cent of the inhabitants over 7 years old are illiterate. Secondary schools are well attended; special schools are mainly agricultural. There are universities at Bucharest (about 3400 students) and Jassy (over 500 students). The religion of the country is the Orthodox.

PRODUCTION. By soil as well as by climate Rumania belongs to the Russian steppes. The black earth of the steppes covers the tableland of Moldavia; the Dobruja and southeastern Wallachia are suited for grazing; cereals are raised on the fertile plains, and fruits and vines in the hills. Were it not that the rainfall is infrequent and after June almost entirely absent, Rumania would be unequalled in Europe as an agricultural country. Most of the people are engaged in some branch of agriculture, and the industry has progressed notably in the last 40 years. In 1866 (the year in which the late King Charles was chosen Prince of Rumania), the area under sown crops was but 2,230,000 hectares; while in 1906 it was 5,520,000 hectares. Forests cover 17.5 per cent of the total area, 7.8 per cent is under pasture, 3.8 under natural grasses, 1.4 under orchards, 46.1 under sown crops and fallow—representing 76.6 per cent of the total area of the kingdom. The country amply feeds itself and is able to export grain, fruits, and vegetables in large quantities. The total area returned as productive in 1913 was given as 6,003,520 hectares, of which 71.73 per cent were holdings of less than 100

hectares, and 28.27 per cent holdings of 100 hectares or over. Under cereals were 5,001,041 hectares, or 83.30 per cent; textile fibres, 118,715 hectares; legumes, 78,345 hectares; industrial plants (beets, tobacco, etc.), 24,757 hectares; market gardens, 23,691 hectares; forage plants, 599,010 hectares; vines and plum orchards, 166,961.

In the following table are shown for 1913-14 and (preliminary figures) for 1914-15 the area under principal crops, the production in metric quintals, and the yield in quintals per hectare in 1913-14:

	Hectares		1000 Qs.		Qs.
	1913-14	1914-15	1913-14	1914-15	ha.
Wheat	2,101,727	1,944,448	12,599	29,600	6.0
Rye	84,067	75,618	496	800	5.9
Barley	568,422	554,900	5,866	5,160	9.4
Oats	427,506	480,968	8,678	8,800	8.6
Corn	2,065,566	2,107,289	27,827	28,000	18.5
Flax	8,357	8,850	9	.....	1.2
Beets *	14,785	13,838	2,249	.....	152.2
Vines †	87,988	83,313	.....	.....	.....
Tobacco	10,955	18,044	76	.....	7.0
Potatoes	10,556	11,288	723	.....	68.4

* Sugar beets. † Production in hectolitres.

Among cereals, wheat has shown the greatest increase, but the crop and the export fluctuate considerably from year to year. In 1866, about 238,360 metric tons, valued at 54,892,000 lei were exported; in 1905, 1,716,000 tons, 251,342,000 lei; in 1911, 1,458,029 tons, 244,803,026 lei; in 1912, 1,371,639 tons, 256,496,420 lei. Viticulture declined by reason of phylloxera, but replanting is proceeding rapidly. The production of wine in 1912-13 (1,518,883 hectolitres) represents a value of about 55,200,000 lei. Plum orchards cover about 72,000 hectares; counting an average of 600 trees per hectare, this gives a total of 43,000,000 trees. In 1912-13 the plum orchards yielded 1,844,394 quintals of fruit, valued at over 21,000,000 lei. Yield of legumes, 1912-13, 2,407,949 hectolitres; of forage plants, 13,767,915 metric quintals. The exportation of cattle is much less than formerly, and swine, of which 178,000 head were exported in 1881, are raised only in sufficient numbers to supply the home demand. The live stock industry is practically stationary, if not on the decline. Estimated number of live stock in 1907 and 1911 respectively: horses, 807,704 and 824,714; mules and asses, 4684 and 4248; cattle (including buffaloes), 2,585,205 and 2,666,945; sheep, 5,104,506 and 5,269,493; goats, 190,703 and 186,515; swine, 1,123,564 and 1,021,465.

As stock raising for exportation has declined, the fishing industry has grown. In place of the large importation common in former years, there is now an annual export valued at about 2,790,000 lei. The state forests yield an average revenue of 30,000,000 lei. In 1866 the petroleum output was 5370 tons; in 1909, 682,000; in 1910, 1,352,300. In 1905 the export of crude petroleum was 52,000 tons; of refined, 120,000; of mineral oils, 90,000; of benzine, 49,000. The total export in 1910 of petroleum and bitumens was 586,151 tons, valued at 38,897,169 lei; of which France took 140,159 tons (13,105,317 lei) and the United Kingdom 125,687 (6,619,839). The output of petroleum in 1913 reached 1,885,225 metric tons—1,677,759 tons from Prahova, 125,722 from Buzau, 41,583 from Dambovitza, 40,161 from Bacau. Minerals and precious metals are said to abound, but only salt, coal,

and petroleum are worked. Salt is a government monopoly.

COMMERCE. The export of wheat was prohibited Oct. 3, 1914, of wheat flour September 30th, of oats August 7th, and of rice August 1st. By a decree of March 15, 1915, the export of barley and rye was prohibited. By an order sanctioned by the law of March 23, 1915, an export duty was put on maize after May 22, 1915. By royal decree of July 30, 1915, the prohibition of the export of wheat, rye, barley, oats, maize, and linseed was removed and an export duty laid on these products.

Trade for four years is shown below in lei (par value of the lei, 19.295 cents):

	1907	1909	1910	1912
Imp. .	480,590,115	368,800,099	409,715,576	627,905,560
Exp. .	554,018,681	465,056,619	616,504,872	642,103,788

The total imports and exports for the year 1911 were valued at 616,504,872 and 691,720,408 lei, respectively. Details of the 1912 trade are given in the table below, values in thousands of lei:

Imports	1000 L.	Exports	1000 L.
Metals and mfrs.	157,098	Cereals, etc.	486,511
Textiles	104,741	Petroleum	66,249
Machinery	65,361	Legumes, etc.	26,732
Woolens	54,411	Timber, etc.	24,422
Vehicles	25,442	Animal products ..	13,758
Apparel	32,634	Live animals	8,996
Skins, etc.	28,602	Metals, etc.	3,914
Silks	21,086	Wool	1,980
Wooden wares ...	21,419	Hides, etc.	3,428

Cereals and their derivatives constitute by far the largest export. This in 1909 amounted to 2,187,763 metric tons, valued at 357,587,891 lei; in 1910, 3,230,235 tons, 489,821,008 lei; in 1911, 4,017,767 tons, 657,653,135 lei; in 1912, 2,940,536 tons, 486,511,471 lei. Below are shown the most important cereal exports for 1911 and 1912, in thousands of lei:

Exports	1911	1912	Exports	1911	1912
Wheat ...	244,824	256,509	Oats	26,386	24,439
Maize ...	188,218	146,699	Millet	4,227	2,875
Barley ...	59,835	37,258	Flour	18,421	22,607
Rye	16,606	9,888	Bran	2,902	5,081

Countries of origin and destination (1912 trade) follow, values in thousands of lei:

	Imps.	Exps.		Imps.	Exps.
Germany..	89,063	49,548	Russia ..	20,150	152,999
Aus.-Hun.	240,435	42,536	Switz. ...	.....	13,933
Bulg.	188,874	94,750	Neth.	37,075	121,066
U. K.	88,001	43,041	Egypt ...	12,874	1,062
France ...	16,536	6,226	Gibr.	287	19,170
Italy	2,048	8,209	U. S.	14,827	25,869
Belgium ..	10,875	56	Other	11,855	11,459
Turkey ...	5,506	52,180			
			Total ..	637,906	642,104

Vessels entered in the 1912 trade numbered 36,968, of 10,805,605 tons; cleared, 36,729 of 10,740,173; 1914, 31,726 vessels, of 9,504,366 tons entered, and 31,333, of 9,299,976 tons, cleared. The merchant marine included, Jan. 1, 1913, 117 steamers, of 30,762 tons, and 532 sailing, of 167,397 tons; Jan. 1, 1915, 133 steamers, of 40,949 tons, and 624 sailing, of 197,799—total, 757, of 238,748 tons.

COMMUNICATIONS. In 1876 the tonnage transported by rail was 574,000, in 1905, 6,723,000;

passengers carried (1876), 742,000 and 6,590,000 in 1905. The 916 kilometers in operation in 1876 earned 12,800,000 lei and the expenditure was 10,000,000 (excess of revenue over expenditure, 3032 lei per kilometer); in 1905 the 3179 kilometers in operation earned 71,000,000 lei and expended 37,500,000 (10,516 per kilometer). There were in operation Sept. 1, 1912, 3690 kilometers of railway, of which 3473 kilometers were state-owned; in operation Sept. 1, 1913, 3763 kilometers, of which the state owned 3549 kilometers; Sept. 1, 1914, 3843 kilometers, of which 3709 state-owned. State telegraph lines in 1913, 9062 kilometers, with 25,308 kilometers of wires and 3143 stations.

While consuming about 40 per cent of the total consumption of fuel oil in Rumania, the railways transport all the petroleum products consumed in the country for various purposes or exported abroad from the ports or through the land frontiers. This was to be changed after the state pipe-line Baicoi-Constantza commenced its operations, when a large part of the products exported via Constantza will be transported to this port by the pipe-line instead of by rail. During the year 1913-14 the number of engines used on the Rumanian railways increased by 61, making a total of 888, of which 751 were using liquid oil, and the remainder solid fuel. In 1913-14 the Rumanian railways consumed 198,085 tons of liquid fuel, showing for the first time for a whole series of years a slight decrease of 6378 tons, or about 3 per cent.

FINANCE. The leu, worth 19.295 cents, is the unit of value. In the table below are shown in lei revenue and expenditure for comparative years:

	1909-10	1911-12	1913-14
Revenue	522,842,688	478,395,230	608,502,889
Expend.	481,921,854	478,395,230	512,253,722

The following table gives details of the budget for 1915-16, amounts in thousands of lei:

Revenue	1000 lei	Expend.	1000 lei
Direct taxes	50,185	War	98,122
Indirect taxes	107,950	Finance	232,042
Stamps	89,900	Instruction	58,930
Monopolies	87,600	Interior	60,247
Public services	159,552	Public works	111,675
Domains	83,806	Justice	14,966
Subventions	22,184	Agriculture	12,595
Finance	76,756	Industry	5,156
Interior	9,557	Foreign affairs	8,417
Justice	8,234	Council	73
Foreign affairs	120	Extraordinary	3,009
Agriculture	106		
Industry	1,568	Total	600,283
War	558		
Public works	87		
Instruction	7,120		
Total	600,283		

The capital of the debt stood, April 1, 1916, at 1,715,386,499 lei.

NAVY. The effective fleet was composed in 1915 of 1 protected cruiser (1320 tons), 1 dispatch boat (130), 5 gunboats (607), 1 training ship (350), 1 torpedo depot (104), 3 gunboats (135), 4 torpedo gunboats (128), 3 torpedo boats (150), 4 police boats (2720), 8 torpedo vedettes (360).

GOVERNMENT. The executive power is vested in a King, assisted by a council of eight members. The legislative body is composed of a Senate of

120 members, and a Chamber of 183 deputies, elected by a system of direct and indirect vote based on property qualifications. Reigning sovereign until 1914, Charles I, born April 20, 1839, elected to the principship in 1866, crowned King May 10, 1881, died Oct. 10, 1914. He was succeeded by his nephew, Ferdinand, son of Prince Leopold of Hohenzollern and of Antonia (infanta of Portugal), born at Sigmaringen, Aug. 24, 1865; married Jan. 10, 1893, to Princess Mary of Great Britain and Ireland. Heir-apparent, Prince Charles, born Oct. 3, 1893.

HISTORY

RUMANIA'S NEUTRALITY IN THE WAR. At the beginning of the year Rumania was momentarily expected to unite her forces with those of the Triple Entente in the war against Turkey and the Central Powers. Premier Bratiano, to be sure, still maintained a cautious reserve, refusing to commit Rumania to intervention; but the sentiment of the Rumanian people seemed to be overwhelmingly in favor of the Triple Entente, and M. Take Jonescu, the influential leader of the Conservative-Democratic party, unreservedly advocated war against Austria-Hungary. The conclusion in January of a \$25,000,000 loan agreement, negotiated by a Rumanian Financial Commission in London, strengthened the belief of the press in France and England that within a very short time Rumania would openly throw off the mask of neutrality. Moreover, the activity of the Russian army in Bukowina (consult the article on the WAR OF THE NATIONS) was expected to exercise a specially potent influence upon hesitant Rumania. For Bukowina, that province of Austria-Hungary lying just southeast of Galicia, with its capital at Czernowitz, contained some 300,000 Rumanians (out of a total population of over 800,000) awaiting their "emancipation" from Austria and unification with Rumania. As the province contained almost as many Ruthenians or Little Russians as Rumanians, Russia, it was held, would have about as good a claim to Bukowina as Rumania had, although historically Bukowina had been connected with the Ruman state of Moldavia before its annexation to Austria (1777). The Entente Powers thus had some reason to expect that when the Russians invaded Bukowina, Rumania would enter the war, out of anxiety lest otherwise the province should be claimed by Russia. If Rumania entered the war in alliance with the Triple Entente, she might also hope to acquire Transylvania, a Hungarian province a little less than half as large as New York State, containing about 1,500,000 inhabitants of Ruman speech (out of a total population of about 2,700,000). English and Russian critics confidently predicted that the prospect of gaining Bukowina together with Transylvania would be sufficient to induce Rumania to enter the war. According to the accepted opinion, Rumania and Italy would both declare war at the same time. This expectation was not confined solely to the unofficial utterance of press correspondents. M. Sazanov, the Russian foreign minister, pointed out that Rumania has "the same interests as Italy, and both have only one enemy to fight, because Austria numbers among her population large masses belonging to the two nations living on her opposite frontiers." The same view was expressed at a dinner in

Paris, January 9th, in the presence of the Rumanian, Greek, Bulgarian, and Serbian ministers, when a Rumanian deputy, Prince Brancevin, drank to the victory of the Triple Entente and predicted that soon "the entire Latin world"—Italy, France, Belgium, and Rumania—would be united against the Central Powers.

Late in January, however, the ardent desire of the Rumanian interventionists to enter the lists against Germany began to cool perceptibly. Germany and Austria-Hungary were massing an enormous force, according to a widely circulated rumor, for the purpose of crushing Serbia and punishing any nation which might have the hardihood to oppose the Teutonic Powers in the Balkan theatre of war. At the same time, newspaper reports indicated that Bulgaria's inordinate demands and Serbia's stubborn refusal to cede all of Macedonia to Bulgaria interposed insuperable obstacles in the way of reconstructing a Balkan-Rumanian alliance. Rumors prevalent in January that the sovereigns of Bulgaria and Rumania were to hold a conference on Rumanian soil, and that a matrimonial alliance was projected to unite the dynasties of Bulgaria and Rumania, were in February declared to be absolutely mendacious. Rumania was warned by Russia that hesitation might be fatal; the Russian foreign minister, M. Sazanov, in a speech before the Duma, February 9th, referred to the hesitant attitude of Greece and Rumania, and warned the governments of the two nations that "they alone will be responsible to their respective nations if they miss a favorable opportunity to realize their national ambitions." A convention signed at Bucharest, February 18th, by representatives of Bulgaria and Rumania, providing for reciprocal advantages in the transit of merchandise, was probably devoid of political significance, except in so far as it manifested general friendly relationship between the two governments. The hope that Rumania would intervene in favor of the Triple Entente again revived at the end of February, when the French General Pau visited King Ferdinand at Bucharest. The hope grew stronger early in March, when the Rumanian Parliament authorized the government to proclaim a state of siege whenever occasion might arise. Late in March information from "a diplomatic source" was published by Reuter's alleging that Rumania had stoutly refused to grant Germany's insistent demands for permission to send a German army across Rumanian territory. In May the question of Rumanian neutrality again came to the fore, when Italy, after long hesitation, at last broke with Austria-Hungary. Would Rumania follow suit? The resignation of M. Marghiloman, the leading opponent of intervention, from his position as chairman of the Rumanian Conservative Party seemed to indicate that the war sentiment was growing stronger in Rumania. M. Lahovary, whom the Conservatives chose as provisional chairman in M. Marghiloman's stead, was known to sympathize with the Entente. In June, however, M. Marghiloman was reported to have retained his leadership of the party, in spite of the efforts of M. Lahovary to displace him. The month of June not only disappointed the hopes of those who looked for Rumania to follow Italy's example; it also brought rumors of a formal agreement between Rumania and Bulgaria, by which Rumania was bound not to attack Austria or Bulgaria. London journals

began to assert the existence of an influential German propaganda in Rumania. "Many newspapers have been subsidized," declared the *London Times*; "new journals have been founded, fiscal and railway officials have been bribed to permit the passage of contraband of war, and no pains have been spared (by Germany's agents) to sow discord between Rumania and her Balkan neighbors."

The success of the Austro-German operations against Russia in August and September instilled new confidence into the pro-German party in Rumania and made Rumania's ultimate alliance with the Entente still more doubtful. When Bulgaria attacked Serbia, October 14th, Rumania showed no inclination to attack Bulgaria in the rear, as she had done in the second phase of the Balkan War, in the summer of 1913. Indeed, the confident assertion of the Bulgarian premier (see *BULGARIA, History*) that Rumania would not attack Bulgaria, seemed to indicate that the Rumanian government had come to a friendly understanding with Bulgaria, and possibly also with the Central Powers. Rumania would have powerful motives for coming to such an agreement with the Turco-Bulgaro-Teutonic coalition; the promise of part of Transylvania and Bukovina; the hope of obtaining Bessarabia from a defeated Russia, and the apparent military inferiority of the Quadruple Entente, would be strong arguments. Rumania's attitude during November and December continued to be the subject of much speculation, and Rumania was alternately represented as refusing to permit the passage of German munitions through her territory, and as preventing Russia from sending an army across Rumanian territory to attack Bulgaria. A military mission sent by Rumania to the capitals of the Entente Powers in October led apparently to no new orientation of Rumania's neutrality policy. At the close of October King Ferdinand publicly promised MM. Jonescu and Filipesco that he would abide by whatever decision the Rumanian Parliament and cabinet might reach with regard to the realization of national ambitions. During November persistent but unfounded rumors asserted that a big Russian army had crossed, or was about to cross, the Rumanian frontier on the way to Bulgaria. On the occasion of the King's speech to Parliament, at the beginning of December, an uproar was caused in the House of Representatives by the disorderly remarks with which an excitable interventionist, M. Mille, repeatedly interrupted the King. On December 19th the suicide was reported of General Jonescu, commander of the second army corps, who was alleged to have accepted bribes from a foreign power.

RUMANIAN LANGUAGE. See *PHILOLOGY, MODERN*.

RURAL CREDIT. See *AGRICULTURAL LEGISLATION*.

RUSSIA. An empire that includes a large part of eastern Europe and northern Asia; it extends from the Baltic Sea to the Bering Sea and from central Europe and Asia to the Arctic Ocean, and covers one-sixth of the earth's total land area. The capital is Petrograd.

AREA AND POPULATION. The first and only general Russian census was taken Jan. 28, 1897. The results of that census and the number of inhabitants as calculated Jan. 1, 1913, together with the area, exclusive of the great internal

waters, in square versts (1 square verst = 439,408 square mile), are shown below:

		Area	Population	
		Sq. versts	1897	1913
Europ'n Russia	4,288,711.7		94,215,400	125,684,800
Poland	111,554.2		9,455,900	11,960,500
Caucasus	412,810.8		9,248,700	12,512,800
Siberia	10,940,644.7		5,699,000	9,788,400
Central Asia	8,110,628.7		5,724,700	10,957,400
Finland	286,041.8		2,555,500	3,196,700

Total 19,099,886.9* 126,896,200 174,099,600

* 21,741,600 sq. kilometers; 8,394,018 sq. miles.

The Polish governments are the most densely populated, Piotrków having 190 to the square verst; Siberia is the most sparsely populated, Yakutsk having but 0.1. In European Russia proper, Podolia (107.1) has the greatest, and Arkangel (0.6) the fewest inhabitants per square verst; in the Caucasus, Kutais (56.2) and the Black Sea government (19.1); in Siberia, Tomsk (5.3) and Yakutsk (0.1), and Kamchatka has but 0.03; in central Asia, Samarkand (19.7) and the Transcasian Province (0.9). The density of the empire as a whole was 9.1 in 1913. Of the total population in 1913, 87,230,400 were male, and 86,869,200 female. The population of the towns was 23,839,900 in 1912, or 13.9 per cent of the whole. In European Russia the town population was 13.2 per cent; in Poland, 23.3; in the Caucasus, 13; in Siberia, 11.6; in central Asia, 13.6; in Finland, 15.1.

Including Bokhara (203,430 square kilometers, 1,500,000 inhabitants), Khiva (67,430 kilometers, 800,000 inhabitants), and the inland seas (Caspian, 438,690; Azov, 37,600; Aral, 67,770), the total area of the empire is 22,556,520 square kilometers, or 8,709,116 square miles; total population, Jan. 1, 1913, 176,399,600.

Slaves (including Great, Little, and White Russians, Poles, etc.) form 91.8 per cent of the population of the empire; Letts and Lithuanians 3.1. The Kalmuks of the Astrakhan steppes are Mongols. Tatar tribes inhabit Southern Siberia. The Cartvelian tribes form 14.5 per cent of the entire population of the Caucasus, and Turco-Tatars 20.2 per cent. Cossacks are found only in the Cossack provinces—Don Cossacks, Orenburg, Amur, etc. To the Orthodox Church belong 69.90 per cent (Russians, Rumanians, most Cartvelians, some Turco-Tatars) of the total population; to Islam, 10.83 (most Turco-Tatars, and the mountain tribes of the Caucasus); to the Roman Catholic Church, 8.91 (Poles and Lithuanians); Finns, Germans, and some Lithuanians are Protestants.

The population increases in European Russia alone at the rate of 1,500,000 annually. Marriages (European Russia), 1911, 942,379; 1910, 978,089; 1907, 985,699. Births, 1911, 5,265,665; 1910, 5,233,711; 1907, 5,221,369. Deaths, 1911, 3,222,275; 1910, 3,598,249; 1907, 3,151,738. The birth rate and the death rate are high.

A few of the larger cities in European Russia follow, with their population as calculated in the year given in parentheses: Petrograd (1914), 2,018,596; Moscow (1912), 1,617,157; Warsaw (1911), 864,000; Odessa (1911), 498,100; Kiev (1913), 417,800; Lodz (1911), 403,720; Riga (1913), 334,600; Kharkov (1913), 252,800; Saratov (1913), 210,100; Vilna (1911), 188,300; Kazan (1911), 182,540; Ekaterinoslav (1911), 151,200; Astrakhan (1912), 150,200; Revel

(1914), 136,500; Tula (1913), 138,900; Rostov-on-Don (1911), 124,500; Kishinev (1913), 126,100; Minsk (1913), 114,400; Nizhni-Novgorod (1913), 111,400; Samara (1913), 106,800; Nikolaiev (1911), 97,500; Orenburg (1911), 93,600; Orel (1913), 95,100; Voronezh (1913), 92,400; Berdichev (1913), 92,800; Vitebak (1911), 86,100; Libau (1911), 86,000; Kherson (1911), 85,300; Kursk (1913), 85,400; Kovno (1913), 88,100; Yaroslavl (1913), 83,600. In Asiatic Russia, 1913, Baku, 230,600; Tiflis, 197,300; Tashkent, 271,600; Omsk, 134,000; Kokand, 119,100; Tomsk, 157,100; Ekaterinodar, 102,100; Ussuriisk, 95,700; Vladivostok (1911), 93,200; Irkutsk, 92,000; Namangan, 86,340. In 1862 there were but five cities (St. Petersburg—Petrograd—Moscow, Warsaw, Odessa, and Riga) with over 100,000 inhabitants; there are now 32. Petrograd ranks fifth among the great European cities in population, and is the centre of an increasing industrial activity. Moscow, almost in the geometrical centre of European Russia, is the converging point for the important highways and railways from all parts of the country. Nizhni-Novgorod is the scene of the great annual Russian fair. Perm is the centre of an extensive mining region and a gateway for trade between Russia and Siberia. Nikolaiev is the chief Black Sea naval point, with strong fortifications, and a floating dock able to receive the largest battleships. Odessa is the principal Black Sea trading port. Saratov, the largest city of the lower Volga, is a manufacturing place. Warsaw is the converging point for commercial routes from all over Russia and western Europe. Riga, at the head of the Gulf of Riga on the Baltic, at the mouth of the Dvina, has an important harbor and is strongly fortified.

EMIGRATION. Figures for the migration into Siberia are incomplete. The figures which follow are given by the board of emigration. The total number of emigrants into Asiatic Russia from 1896 to the end of 1909 is returned at 3,616,993, of whom 2,920,626 were actual emigrants, and 696,367 were forerunners sent ahead to search out sites. Total number from 1896 to the end of 1912, 4,783,020. Emigrants in 1910, 352,950 (of whom 316,163 emigrants and 36,787 forerunners); 1911, 226,062 (189,791 and 36,271); 1912, 259,585 (201,027 and 58,558). The number returned to European Russia in 1910 was 146,145; 1911, 142,952; 1912, 98,388. Emigrants to foreign countries in 1913 numbered 327,430; number returning, 110,164. Emigrants to the United States in 1913, 291,040; 1914, 255,600.

EDUCATION. Primary education is in the hands of the minister of public instruction and of the Holy Synod, and to the Holy Synod is entrusted the expenditure of a large part of the appropriation for education. Instruction is totally inadequate, and in many of the rural districts nominal only; while many of the teachers are without proper qualification. The total primary attendance in 1911 is reported at only about 6,000,000 for the empire. The Central Statistical Committee reports the number of schools in the empire Jan. 1, 1912, at 122,524, with 7,266,694 pupils, of whom 6,512,173 are primary. Finland has an admirable school system, with which, however, the Russian government has been disposed to interfere. These are secondary schools in the central districts; special

schools are few and inferior. The universities have a total attendance of about 40,000.

AGRICULTURE. The principal occupation of the various peoples of the empire has been from earliest times agriculture and its branches, notably cattle raising. Yet it is only in recent years that any concerted attempt has been made by general and local government to improve agronomic conditions. Russia is at the foot of the list of great grain-producing countries in rate of yield. Extensive area and sparsity of population reduce the necessity for intensive cultivation. The spirit of serfdom was not abolished by the act of emancipation; an ignorant and overburdened population does not rise in one century from a condition of servitude to a knowledge and practice of efficient, scientific, modern methods, especially in a country where distance is so formidable an obstacle to transportation inwards of machinery and supplies, and outwards of the accumulated harvest. Foreign markets being largely inaccessible and the capacity of home markets limited, the probability of an advantageous disposal of increased harvests does not present itself to the laborers in these remote fields; therefore there is no incentive to increased efforts and improved methods. In the more accessible regions, however, the peasants are beginning to realize the necessity for agricultural reforms, and government aid is being extended. Agricultural coöperative societies, which numbered only 270 at the beginning of the century, had increased to 1000 by the end of 1905, and to 3964 by Jan. 1, 1913. Unions established by the board of agriculture increased from 50 in 1900, to 902 in 1913; loan and savings associations from 836 in 1903, to 3034 in 1913; credit coöperative associations from about 400 in 1903, to 7881 in 1913. At the end of 1913, therefore, the coöperative associations concerned almost exclusively with agriculture numbered about 15,800. The total state outlay for agricultural purposes was 21,800,000 rubles in 1912; zemstvo expenditure in 1911, 11,311,000—not large sums in proportion to area of cultivated lands.

Out of the total population censused in 1897, 88,300,000, or more than 70 per cent, made their living directly by agriculture. In addition, 4,500,000, or almost 4 per cent, were engaged in cattle raising. These figures, which include three quarters of the entire population, are exclusive of persons engaged in forestry, hunting, fishing, etc.

In 1915, the total area estimated as planted to cereals other than oats, was 71,210,849 dessiatines (1 dessiatine = 2.7 acres); potatoes, 3,256,533; oats, 16,589,615; in natural meadows, 30,394,457—a total of 121,451,444 dessiatines for the 64 reported governments. The influence of the war of the German invasion is shown by the reduction of the area under cereals in the western regions by 1,769,579 dessiatines from that of 1914, but Siberia compensates by an increase of 2,015,343. Of the total grain area, 27,161,301 dessiatines were under wheat (winter and spring), 25,567,284 under rye, 16,589,605 under oats, 11,018,918 under rye (spring), 2,990,951 under millet, 1,640,545 under buckwheat, 1,501,617 under corn, 1,128,424 under legumes, 201,809 under polba—a total of 87,800,454 dessiatines, of which 31,412,447 dessiatines under winter and 56,388,007 under spring cereals. In comparison with 1914, the area under cereals de-

creased by 2,860,420 dessiatines; the decline of winter crops was 143,784 and of spring crops 2,716,636 dessiatines.

In the table below are given (official) figures for the distribution of agricultural lands (1909) in dessiatines (1 dessiatine = 2.7 acres) by great divisions:

	Crops	Pasture	Forest
European Russia*	74,880,800	28,549,600	139,543,700
Poland	5,163,700	867,700	2,177,200
Caucasus	7,546,300	1,958,100	4,967,200†
Siberia	5,273,600	5,568,500	288,189,100†
Central Asia	1,738,600	2,597,900	15,370,700†

* Fifty governments. † Forest administered by the forestry department.

In the following table are shown areas in the great divisions under all cereals in dessiatines, the total production of cereals in thousands of poods (1 pood = 36.113 pounds) for 1912, and the mean crop in thousands of poods for the period 1907–11 (exclusive of winter barley and oats):

	Des.	P. 1912	P. 1907-11
European Russia	63,848,552	8,896,205	2,852,474
Poland	3,132,682	243,280	215,527
Transcaucasia	1,680,522	85,670	72,684
Western Siberia	8,480,100	155,787	126,872
Eastern Siberia	607,129	27,758	26,344
Steppes	1,747,682	72,048	85,545
Turkestan	2,057,890	106,815	94,887
Total	76,004,557	4,087,007	3,423,674

In the next table are given official figures for area in hectares and production in thousands of metric quintals of main crops for comparative years, with the production per hectare in 1913–14:

	Hectares		1000 Qs.		Qs.
	1913-14	1914-15	1913-14	1914-15	ha.
Wheat*	6,923,686	9,068,595	58,478	82,056	8.4
"	18,029,115	17,081,867	97,548	126,183	5.4
"	5,766,852	5,881,115	48,810	39,149	8.5
Rye*	26,652,072	26,297,867	200,005	239,210	7.5
"	243,040	248,772	1,438	1,842	5.9
"	1,237	1,621	9,916	7,207	8.0
Barley*	12,103	11,505	81,842	107,108	6.8
"	467	657	4,310	8,931	9.2
Oats*	16,407	15,498	104,878	139,208	6.4
"	2,582	2,890	23,601	20,148	9.1
Corn*	1,293	1,622	20,602	19,001	17.8
"	2,861	7,027	10,811	81,902	4.6
Flax	1,338,845	.....	.....	.....	.....
Potatoes	8,642,257	.....	247,545	.....	68.0

* European Russia, 54 governments. † Asiatic Russia, 10 governments (9 in 1914). a Winter grain. b Spring grain.

Official returns for live stock, giving number on July 1, 1912, compared with July 1, 1911, show a notable decrease of all classes:

	Europe*		Asia†	
	1911	1912	1911	1912
Horses	24,795,151	23,860,178	7,194,538	6,865,878
Cattle	37,817,182	34,547,848	8,319,074	7,381,247
Sheep	45,988,702	42,735,567	17,165,204	16,257,736
Swine	12,422,966	11,944,568	1,132,587	918,634

* 63 governments. † 10 governments. a And goats.

Figures for 1913 show 33,836,000 horses of all ages (21,606,000 in European Russia proper, 1,245,000 in Poland, 2,072,000 in the Caucasus, 4,464,000 in Siberia, 4,476,000 in central Asia). Cattle, 51,355,000 (European Russia, 32,027,000; Poland, 2,261,000; Caucasus, 6,037,000; Siberia,

5,954,000; central Asia, 5,076,000). Sheep and goats, 73,962,000 (European Russia, 36,376,000; Poland, 781,000; Caucasus, 11,916,000; Siberia, 5,195,000; central Asia, 19,694,000). Swine, 14,532,000 (European Russia, 11,099; Poland, 550,000; Caucasus, 1,243,000; Siberia, 1,191,000; central Asia, 149,000).

FORESTS. The forests of European Russia cover an area estimated at 345,000,000 acres (exclusive of Finland), of which 61.8 per cent belong to the state, 25.6 per cent to private owners, 7.6 per cent to the peasants, 3.2 per cent to the crown, and 1.8 per cent to other owners. The table below shows area in desiatines of crown forests and area worked by the government, by great divisions:

	Total D.	Worked D.
European Russia	105,388,965	84,801,741
Poland	778,586	720,878
Caucasus	4,930,524	8,099,068
Siberia	217,192,375	77,455,522
Central Asia	20,854,292	14,264,890
Empire	349,094,692	179,851,094

The revenue from state forests for the year 1914 was given at 103,141,000 rubles (92,712,000 in 1913), and the expenditure at 41,213,000 (34,587,000). See **FORESTRY**.

MINING AND METALS. The most extensively exploited mines lie in the Urals, the Altai, Obdorsk, and Sayan regions, and in Transbaikalia. Some precious stones are found, and marble is quarried in Finland and the Crimea. The table below gives the production for comparative years of the most important products of the mining and metallic industries, in poods:

	1909	1911
Gold	3,467½	8,584
Platinum	812½	852½
Silver	941	947
Lead	49,673	75,585
Zinc	586,434	745,575
Copper	1,125,885	1,594,087
Pig iron	176,122,472	219,118,278
Iron and steel	146,415,257	176,245,287
Manganese	45,092,205	48,122,503
Coal	1,632,218,785	1,734,689,649
Naphtha	568,002,720	558,748,855
Salt	148,487,340	122,940,380

The average annual coal output is estimated at 24,200,000 tons. The import of foreign coal and coke into Russia in 1910 was 4,652,666 metric tons. Coal mined in 1910, 1,555,650,000 poods; in 1912, 1,813,910,000. From the Donetz basin (a region in Ekaterinoslav, covering about 16,000 square miles) comes a large proportion of Russia's coal—12,697,700 tons in 1910. Poland has an annual output of over 5,666,000 tons. A poor quality of coal is abundant in Siberia. Output of pig-iron, 1912, 256,265,000 poods; worked iron and steel, 227,540,000; petroleum, 565,300,000; salt, 114,680,000. Output of petroleum, 1913, 560,000,000 poods.

MANUFACTURES. It is only during the last few decades that Russia had developed manufacturing industries of importance. Previously manufactured goods were mainly imported into the country; but it is rapidly becoming independent of foreign goods. Cottons are manufactured, chiefly in Poland; other manufactures are flax and silk, sugar, tobacco, hemp, paper, flour, furniture, etc. Distilling is a government monopoly (after the outbreak of the great war the sale of alcoholic liquors was prohibited).

Agricultural machinery is now made on a large scale, and peasant industries (wood carving, metal working, etc.) are important.

One of the largest undertakings connected with the war is the removal of industrial enterprises from regions threatened by the enemy. Questions concerning help for evacuated enterprises and the choice of sites for their reconstruction are dealt with by a special committee. The zemstvo and city administrations extend aid to the special committee in the task of selecting new sites, and often tender their own land for this purpose. Much care is taken to sort out workmen from the flood of refugees. This is no easy task, because the German invasion has given rise to what is literally a wholesale migration of peoples. With reference to the selection of appropriate spots for the reinstallation of evacuated industries, S. Dunin-Martsinkevich, in the official *Commercial and Industrial Gazette*, suggests that many of these mills and factories could be at once removed to Western Siberia. He points out that since the railway rolling stock proceeding in that direction is usually more than half empty, the distance of Western Siberia does not offer any insuperable obstacle. Even in peace time this region possessed interest for the industrial world in being itself a market of considerable magnitude. Siberia, though rich in raw material and fuel, for lack of local industry has been obliged to sell the former at a low price and send it thousands of kilometers for manufacture in the very factories and mills now being removed, while the products manufactured from Siberian raw material have been conveyed back to Siberia for consumption. Novo-Nikolaevsk is regarded as one of the most suitable towns in which to set up these transplanted industries, in view of its central situation in the richest agricultural region of Siberia and on the banks of the navigable Ob at the point of intersection with the Siberian Railway. The construction of the Altai Railway, uniting Novo-Nikolaevsk with the Altai and the towns of Barnaul, Biysk, and Semipalatinsk, has just been completed. Moreover, the construction of a railway connecting the district with the rich Kolchugin coal seams is nearing completion. Thus the majority of the enterprises transferred thither, especially the manufacture of agricultural machinery, might resume their activities almost immediately, being guaranteed cheap and convenient supply of all essential requirements.

FISHERIES. The principal regions where fishing is carried on, the number of persons engaged in the industry, the quantity yielded in poods, and the value in rubles are shown in the table below for 1912:

	No.	Poods	Rubles
Caspian	172,000	23,167,000	66,367,000
Upper Volga	10,000	2,916,000	2,208,000
Black Sea	35,000	4,182,000	6,262,000
Baltic Sea	21,000	2,697,000	5,294,000
Lakes	11,000	1,908,000	2,928,000
Murman *	14,000	900,000	2,000,000
Total Europ. Rus. . . .	263,300	35,671,000	85,281,000
Total Asiatic Russia. .	33,800	8,252,000	11,924,000
Total Empire	296,200	43,923,000	97,155,000
* And White Sea.			

COMMERCE. The export of cereals, flour, and linseed, except to allied countries, was prohibited from Aug. 8, 1914. Exceptions might be author-

ized for exports to neutral countries. By imperial ukase of March 10, 1915, the export of foodstuffs and of fodder has been prohibited, except under special permit given by the government in each case. By a decree dated May 17, 1915, the export of maize is permitted if destined for allied countries. In the table below is shown the trade for comparative years by the great avenues of distribution—A, by way of the European and Black Sea (Caucasus) frontiers; B, across the Asiatic frontier; C, to and from Finland; D, total across all frontiers; values in thousands of rubles:

Imps.	1910	1911	1912	1913
A	897,000	960,800	991,800	1,169,500
B	148,100	159,400	90,700	96,200
C	88,700	42,000	42,700	51,000
D	1,084,400	1,161,700	1,125,200	1,316,700

Expts.	1910	1911	1912	1913
A	1,288,800	1,340,600	1,377,800	1,365,500
B	177,500	197,100	135,000	162,400
C	42,800	58,700	49,200	55,300
D	1,449,100	1,591,400	1,562,000	1,583,200

The statistics to follow relate to trade by way of the European and Black Sea (Caucasus) frontiers, and to and from Finland; trade by great classes is given (1911-13), in thousands of rubles:

Imports	1911	1912	1913
Foodstuffs	134,134	140,198	163,014
Raw materials	517,046	516,267	600,906
Animals	3,457	2,581	8,099
Manufactures	368,062	375,456	453,455
Total	1,022,699	1,084,502	1,220,474

Exports	1911	1912	1913
Foodstuffs	988,547	788,608	807,201
Raw materials	478,486	578,786	550,223
Animals	25,831	30,068	32,985
Manufactures	25,873	29,571	30,446
Total	1,518,737	1,427,033	1,420,855

The cereal export in 1910 was much greater in quantity than in 1909 (847,084,000 poods, against 760,746,000), but the total value was somewhat less. The principal details of the cereal export are given below for 1912 and 1913:

	1000 poods.		1000 rubles	
	1912	1913	1912	1913
Wheat	160,900	203,100	192,200	225,100
Rye	30,600	39,500	29,000	32,900
Barley	168,300	239,500	152,800	186,100
Oats	51,700	36,400	51,800	31,800
Corn	46,900	35,500	87,800	25,100
Other	89,500	98,800	83,000	88,900
Total	547,900	647,800	546,600	589,900

The principal articles of imports for consumption and of export of domestic produce follow, for 1913, with values in thousands of rubles:

Imports	1000 r.	Exports	1000 r.
Cotton	100,098	Cereals and flour ..	589,942
Machinery	163,739	Timber	163,610
Tea	30,607	Flax and tow	86,848
Wool	53,116	Eggs	90,639
Metals	52,781	Butter	71,159
Rubber	42,279	Oil cake	38,530
Coal and coke	86,656	Oil, seeds, etc.	34,426
Metal mfrs.	13,153	Live animals	32,985
Silk	27,248	Petroleum, etc.	48,503
Fish	35,051	Furs, etc.	52,422
Timber	49,878	Hemp	20,261
Hides	57,091	Raw metals *	19,272

Imports	1000 r.	Exports	1000 r.
Woolen yarn	18,950	Manganese ore	14,577
Paper	40,600	Wool	10,541
Chemical prods.	59,528	Meat	9,398

* Chiefly platinum.

The principal articles of export across the Asiatic frontier are sugar and cotton goods; imports, rice and raw cotton.

The next table gives imports and exports by great countries of origin and destination, in thousands of rubles, for four years:

Imports	1909	1911	1912	1913
Germany	354,822	476,839	519,114	642,756
United Kingdom	128,017	153,875	139,250	170,352
United States	57,917	100,813	85,697	74,171
France	49,002	56,170	55,168	58,015
Austria-Hungary	26,917	37,784	32,053	34,638
Finland	82,974	40,002	42,713	50,964
Netherlands	18,109	17,453	19,149	21,540
East Indies	13,960	24,414	25,668	29,997

Exports	1909	1911	1912	1913
Germany	387,018	490,139	453,743	452,637
United Kingdom	288,748	336,740	327,187	266,864
Netherlands	189,198	188,849	153,994	177,455
France	89,061	90,807	98,001	100,857
Italy	67,785	52,708	52,476	73,685
Finland	51,801	53,665	49,185	55,292
Belgium	64,392	55,345	58,851	64,642
Austria-Hungary	60,875	67,973	73,400	85,256
Denmark	36,728	35,605	38,085	35,754

According to data drafted by the ministry of finance, Russia's foreign trade by the European and Caucasian Black Sea frontiers and with Finland for the first six months of 1915 was as follows: exports, 94,984,000 rubles; imports, 181,243,000; total, 276,227,000; excess of imports, 86,259,000 rubles. The figures show that in comparison with the corresponding period of the previous year the value of exports declined by 582,600,000 rubles, or 86 per cent, and of imports by 528,871,000 rubles, or 74.5 per cent. On the other hand, for the same period, the export trade with Finland appreciably increased, viz., by 33,833,000 rubles.

The export of cereals for the first six months of 1915, as compared with the same period of the previous year, amounted to only 4 per cent in quantity, and 8 per cent in value, the bulk of the cereals being exported to Finland, viz., 10,513,000 poods (168,208 tons), out of the total of 12,623,000 poods (201,968 tons). Of other food products, more wheat, rye, and potato flour, starch, fruits, fresh pork, and red caviar were exported than during the first half of 1914.

Russian exports were sent to the United Kingdom, France, Rumania, Sweden, Serbia, Norway, Denmark, Italy, America, Bulgaria, Greece, and Finland. The exports to Finland and Serbia increased considerably. Imports increased from Sweden, Japan, Bulgaria, and Finland, but from all other countries they declined. The largest actual quantity of commodities came from the United Kingdom (54,461,000 rubles) and Finland (34,615,000 rubles).

SHIPPING. Vessels and tonnage entered and cleared in the total foreign trade of the empire (1912) are shown in the following table:

Ports	Entered		Cleared	
	No.	Tons	No.	Tons
White Sea	1,033	816,000	994	816,000
Baltic	7,390	5,656,000	7,424	5,674,000
Black and Azov ..	3,705	5,712,000	3,586	5,575,000
Pacific Coast ..	2,124	935,000	.....	.....

In the table below are shown number and tonnage of total merchant vessels Jan. 1, 1914, and number of tonnage of steamers included in total:

	Total		Steamers	
	No.	Tons	No.	Tons
White Sea	508	37,017	80	18,644
Baltic	992	200,341	265	128,298
Black and Azov. .	1,325	291,489	416	240,817
Pacific	49	28,988	89	23,523
Caspian	881	280,184	244	106,721
Total	3,700	788,019	1,044	518,003

COMMUNICATIONS. For April, 1915, the receipts of state railways totaled 63,874,000 rubles, as against 66,031,868 rubles for the same month the previous year; the corresponding figures for the privately owned lines were 27,601,103 rubles and 26,569,138 rubles, respectively. For the term from January 1st to the end of April, 1915, and 1914, the receipts of state railways were 239,005,745 rubles and 284,573,719 rubles, respectively. State railways in 1913 had a length of 35,211 versts; private lines, 16,820; local lines, 2257—a total of European lines of 54,288 versts. Adding to this figure 15,971 versts in Asiatic Russia, a total is obtained of 70,259 versts (46,572 miles) for the empire. State telegraph lines, 212,774 kilometers (with 570,947 kilometers of wire); police lines, 480 (480); railway lines, 17,027 (234,997)—a total of 230,281 (806,424), or 143,090 (501,088) miles. State telegraph stations, 5111; railway telegraph stations, 4415; wireless stations, 23, with 81 on board vessels. Urban telephone lines, 16,398 kilometers (807,176 kilometers of wire), or 10,189 (501,555) miles; interurban, 4071 (18,839), or 2530 (11,706) miles. Post offices, 18,050; postal receipts, 330,635,978 francs; expenditure, 220,693,986 francs.

The numerous attempts made during centuries to establish the sea route to the mouths of the Ob and the Yenisei have shown the importance of it, but the present war has made it still more important. As the Baltic Sea is closed for traffic and the Siberian Railway is largely or exclusively used for military purposes, this route should become an outlet for the vast surplus stock of produce in Siberia.

Petrozavodak, on Lake Onega, capital of the government of Olonets, has been selected as the objective of a railway from the south to the north, and thither from the direction of Petrograd is advancing the new Olonets Railway, the construction of which was to be completed by the end of 1915. From Petrozavodsk the rails are being laid northward, at first to the northern terminus of Lake Onega, then between Lakes Sego and Vyg. It reaches the shores of the White Sea at Soroka Bay, and, swerving a little to the northwest, reaches the town of Kem, the most important administrative and industrial centre of this district. Here ends the first section of the new railway. The second is being laid between many small lakes and amid swamps, marshes, and virgin fir forests, to Kandalaksha, a big settlement of fishermen, situated between the sea and the extensive Lake Imandra and along both banks of the swiftly flowing Neva. From Kandalaksha the new route has to intersect the Kola Peninsula, the northern shore of which, called the Murman coast, is washed by the Arctic Ocean. This is the third section. The line will reach the Murman coast at the small

town of Kola and will be called the Murman Railway.

The new railway leading from the capital, Petrograd, to Ekaterina, a port in the Arctic, was virtually completed in 1915, and available for war supplies traffic. This line was built under the direction of American engineers, an army of 10,000 men, mostly prisoners, being employed upon it. Its terminus is on the northern coast of the Gulf of Kola, where large docks and sheds were constructed. In six months 1220 miles of this railway were built. Boats unable to reach Archangel will be able to go to Ekaterina at all seasons of the year. Ekaterina, some 300 miles to the northwest of Archangel, is an ideal terminus for a railway. Although north of Archangel, and almost within the Arctic Circle, it is ice-free all the year round, owing to its being within the influence of the Gulf Stream, while the waters of the harbor are also calm when the north Arctic storms are prevailing. Archangel had been Russia's principal port for the delivery of munitions from abroad, but the single-track line was unable to handle the enormous munition traffic expeditiously enough. Even the most powerful ice-breakers could not keep the White Sea open all the winter, and the Russian government accordingly decided on the construction of the Petrograd-Ekaterina line. A modern standard gauge railroad from Alexandraska to Petrograd was being completed by British capital. The former place is an open port to the north of Archangel. Work on the road was being pushed rapidly, but it was not expected that the construction could be completed before the summer of 1916.

The Altai railway connecting Novoikolaievsk on the Trans-Siberian Railway with Semipalatinsk, in the Steppes—501 miles in length—was opened during the summer of 1915. The new railway will serve the richest agricultural and mineral regions of Siberia. The Altai region has deposits of gold, silver, lead, zinc, and copper, which were worked in the eighteenth and nineteenth centuries, but afterwards abandoned owing to lack of transportation facilities and other causes. It contains also the exceedingly rich Kuznetz coal basin, 6000 square miles in extent. The line was completed 14 months within the contract time. The central offices were to be in Barnaul.

That part of Russia under German occupation naturally experienced changes in the way of destruction as well as construction of railway facilities, the German officials repairing and changing to German standard the gauge of the lines in occupied territory with great speed. The gauge of the Libau-Romny line was adapted for German cars, and as early as September the line as far as Mitau was in working order. The bridges that had been destroyed were temporarily replaced by wooden ones, and later in the year iron bridges were being built. The Courland railways working at the end of the year under German control included the Libau-Muravievo-Mitau and the Libau-Hazenpoh lines. The Germans had not repaired the Windau-Tuckum-Mitau line. From Mitau trains went as far as Tauerkaln, and a direct narrow-gauge railway was built between Memel and Prekulin. In the Kovno province a narrow-gauge line was constructed from Tauroggon to Shavli, later to be extended to Bausk.

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Archangel there was involved the improvement of the railway facilities between Vologda and Archangel. Sufficient progress was made by the summer of 1915 so that it was possible to run broad-gauge cars from any part of Russia to Archangel, and for part of the distance from Vologda to Archangel the line was double tracked, a narrow-gauge line being retained so that the narrow-gauge equipment could be used. The line through Lapland between Kandalaksha and Kola also was being completed, so that cars were to be run over the line early in 1916. Kola during the winter season was to be substituted for Archangel as a port, as there was no heavy ice at the former place as there is at Archangel. During the winter three cargo ice-breakers, one of 2500 tons' capacity, and two of 500 tons' capacity, were provided for the run between Kandalaksha and Sorotakoe, the voyage taking about 24 hours each way.

The Russian State Railway Department in the summer of 1914 placed orders for 400 locomotives of the Decapod type in America—250 with the Baldwin Locomotive Works, 100 with the American Locomotive Company, and 50 with the Canadian Locomotive Company. The first shipment of these locomotives was made towards the end of August, 1915, the engines being built, tested, knocked down, and packed for shipment. They operate on a 5-foot-gauge track used on a large part of the Russian State Railways. Shipments continued through the year. During 1915, 5000 general-service steel gondola cars were being built in the United States for the Russian State Railways. A test load of 154,000 pounds was required. The cars weigh 46,000 pounds each, and resemble those in use in the United States. The body is 40 feet by 9 feet 6¾ inches and 4 feet 4 inches high. The Russian type of Westinghouse air-brake equipment was used, the couplings of hook-and-link type, and the buffers were of the Russian standard.

The Ministry of Ways of Communication submitted its 1916 estimate for the railways. The receipts, according to estimate, would amount to \$365,285,000, or less by \$89,765,000 than those of 1915. The outlay, according to the estimate of the Railway Department, was estimated at \$342,490,000, or \$10,300,000 less than in the preceding year. In consequence of the increased cost of labor on the Treasury railways, the higher prices for Donetz coal, the increased expenditure in maintenance of staff, the heavier repairs of locomotives and cars, the increased expenses in improving the roads, in compensating for personal damage, loss, etc., it was estimated that the increased expenditure for working the Treasury railways would amount to about \$21,675,000.

FINANCE. In the Imperial Duma, on Aug. 31, 1915, A. I. Shingarey reported on the bill for the expansion of the note-issuing powers of the Imperial State Bank, in part, as follows: "Up to August 1st (1914) war outlays had been effected to the amount of 6,043,000,000 rubles, and for this time credit operations were carried out to the face value of 6,899,000,000 rubles. Thus war expenditures have been covered exclusively by credit operations. For 1915, as stated by the minister of finance, is required 10 milliards to cover war outlays and the current needs of the state. For this purpose since January 1st (1914) the sum of 4,181,000,000 rubles has been obtained from credit operations, while the re-

ceipts of ordinary revenue are expected to be 2,796,000,000 rubles, and by the end of the year credit operations will be concluded for 3,030,000,000 rubles. The deficit in revenue amounts to 336,000,000 rubles, and is the result, on the one hand, of the war, and, on the other, of the prohibition of the sale of state liquor, which has entailed a loss to the state of 800,000,000 rubles. The income tax will not cover this amount, but it constitutes a foundation upon which it will be possible to build a correct financial policy. It is to be hoped that in the budget for 1916 the minister of finance will present a plan of radical financial reform.

"I have often argued with the ex-minister of finance, but I must agree with his announcement in the Imperial Council that we are entering upon a period of merciless taxation. An arduous war imposes upon the Russian state many obligations. We have already borrowed six milliards of rubles, which requires for payment of fresh interest about 300,000,000 rubles. We shall, perhaps, borrow a large sum, but the Russian state will conduct this war to a victorious close."

Gold is the standard of value, and the ruble, par value 51.456 cents, is the monetary unit. In the table below are shown in rubles actual revenue and expenditure, ordinary and extraordinary, for 1913, and the budget estimates for 1914 and 1915:

	1913	1914	1915
Rev. ord.	3,417,859,530	3,572,169,478	3,080,108,314
" extraord.	13,845,256	13,400,000	154,200,100
Total	3,431,204,786	*	3,234,308,414
Exp. ord.	3,094,248,094	3,309,523,517	3,078,814,461
" extraord.	288,665,314	304,045,881	155,493,953
Total	3,382,913,408	3,613,569,398	3,234,308,414
* The total, 3,613,569,398 rubles, includes 27,999,925 from treasury.			

The details of the budget for 1915 are given in the table below in thousands of rubles:

Revenue	1000 r.	Expend.	1000 r.
Direct taxes	342,465	Public debt	489,707
Indirect taxes	694,184	Council	8,912
Customs	508,914	Holy Synod	49,189
Royalties	324,172	Civil list	16,360
Domains	1,068,286	Foreign affairs	7,790
Land sales	1,827	War	598,714
Redemptions	1,865	Marine	204,879
Repayments	123,838	Finance	855,328
Various	15,112	Commerce, etc.	57,430
Total ord.	3,080,108	Interior	208,701
Extraord.	154,200	Instruction	146,652
		Communications	710,588
		Agriculture	146,652
		Justice	101,602
		Audit	12,996
		State stud.	8,838
		Other	10,000
		Total ord.	3,078,814
		Extraord.	155,494
Total	3,234,308	Total	3,234,308

The total public debt stood, Jan. 1, 1914, at 9,888,309,698 rubles.

ARMY. See **MILITARY PROGRESS.**

NAVY. No reliable information regarding naval construction of belligerent nations is available since the beginning of the war of the German invasion. The number and displacement of warships built and building, of 1500 or more tons, and of torpedo craft of 50 tons and over,

were, July 1, 1914, as follows: Battleships, dreadnought type (having a main battery of all big guns, 11-inch or more in calibre), none built (7, of 159,509 tons estimated, building); 7 battleships, predreadnought type (of about 10,000 or more tons displacement and with main battery of more than one calibre), of 98,750 tons; 2 coast-defense vessels, of 10,380; battle cruisers, none built (4, of 128,000, building); 6 armored cruisers, of 63,500; 9 cruisers, of 62,845 (and 8, of 53,600 tons, building); 91 torpedo-boat destroyers, of 36,748 (and 44, of 53,664 tons, building); 14 torpedo boats, of 2132; 30 submarines, of 6506 (and 19, of 13,284 tons, building)—a total tonnage built of 270,861, and 407,957 building; total tonnage built and building, 678,818. Several powerful ships under construction in 1914 should have been in commission by the time the Baltic again became navigable. The Baltic fleet was commanded at the beginning of the war by Admiral von Essen. The total personnel was about 80,000. Air craft included 6 military dirigibles on hand and 10 ordered, and 250 military aeroplanes on hand, including monoplanes, biplanes, and hydroaeroplanes. See NAVAL PROGRESS.

GOVERNMENT. The Russian Empire has been nominally a constitutional monarchy, but in fact the legislative and the judicial power, as well as the executive, remains in large part in the hands of the Czar, who bears the title of Emperor of all the Russias. The council of the empire includes an equal number of elected members and members nominated by the Czar. There is a national assembly (Duma) of 446 members elected indirectly for five years. Reigning Czar, Nicholas II, born May 6 (18), 1868, succeeded his father, Alexander III, Oct. 20 (Nov. 1), 1894. On Nov. 14 (26), 1894, he married Princess Alix of Hesse. The heir-apparent, Grand Duke Alexis, was born July 30 (Aug. 12), 1904.

HISTORY

THE FEBRUARY SESSION OF THE DUMA. On Feb. 9, 1915, the Duma was convoked in its first session since the historic debates of August, 1914, at the outbreak of the war. Premier Goremykin expressed unwavering confidence in the ability of the army to achieve ultimate victory. "Our heroic army," he said, "the flower and the pride of Russia, strong as never before in its might, notwithstanding all its losses, grows and strengthens." He dwelt with evident satisfaction on the beneficial results of the abolition of the sale of vodka. With the working classes emancipated from alcohol, he predicted, and with more favorable conditions assured for the exportation of Russian agricultural products, as a result of the war Russia would make mighty strides towards prosperity and wealth. The majority of the Duma appeared to share the premier's optimism; the only sign of dissent was given by a Socialist deputy, who delivered an ill-received demand for peace. The Duma's sitting on the afternoon of February 9th was signalized by a very important speech of the foreign minister, M. Sazanov. After passing in review the events of the past six months, and summarizing once again the circumstances under which Russia had taken up arms in defense of the rights of smaller nations, M. Sazanov took pains to deny the stories, which, he said, the German diplomats had maliciously circulated in

regard to Russian affairs. Most emphatically he denied the "malevolent German invention" that Russian troops had organized pogroms or massacres of the Jews. "I seize this opportunity of speaking in the parliamentary tribune," he said, "to deny this calumny categorically, for if the Jewish population in the theatre of war is suffering, that is an inevitable evil, since the inhabitants of regions where hostilities are proceeding are always severely tried. Moreover, eyewitnesses are unanimous in stating that the greatest devastation in Poland is the work of the Germans and Austrians." In respect of the ambitions of Russia for southward expansion at the expense of Turkey, M. Sazanov made the cryptic but much-quoted statement that "the events on the Russo-Turkish frontier while covering the Russian arms with fresh glory, will bring Russia nearer to the realization of the political and economic problems bound up with the question of Russia's access to the open sea." As for the Armenians, he made the following promise: "The Russian government disinterestedly endeavored to alleviate the lot of the Armenians, and the Russo-Turkish agreement of Jan. 26, 1914, is a historical document in which Turkey recognizes the privileged position of Russia in the Armenian question. When the war ends, this exclusive position of Russia will be employed by the Imperial government in a direction favorable to the Armenian population." M. Sazanov denied that the invasion of Persia by Russian troops was a violation of Persian neutrality; he also made the significant declaration that Anglo-Russian relations in the Persian question were "more than ever based on mutual and sincere confidence and coöperation, which are a guarantee of the pacific settlement of any eventual conflict. Russia's relations with Japan were characterized by the greatest cordiality; Japan's demands upon China (see CHINA) contained nothing contrary to Russian interests. The sitting was concluded with speeches by Progressist, Octobrist, and Nationalist representatives, and the following resolution was passed by the Duma: "The Duma, saluting the glorious exploits of our soldiers, sends to the Russian army and navy a cordial greeting, and to our allies an expression of sincere esteem and sympathy. It expresses its firm conviction that the great national and liberating objects of the present war will be achieved, and declares the inflexible determination of the Russian nation to carry on the war until conditions shall have been imposed on the enemy assuring the peace of Europe and the restoration of right and justice." Before adjourning, the Duma expressed its desire, (1) that the government take measures for the relief of provinces suffering from the effects of the war; (2) that the government work out a scheme of complementary pensions for the support of the children deprived of fathers by the war; (3) that military reserves doing police duty be summoned to the colors and replaced by soldiers still capable of serving as police; (4) that a commission be appointed to investigate violations of international law and of the customs of civilized warfare committed by the Germans, Austro-Hungarians, and Turks, and to ascertain the damages sustained therefrom by private persons and public organizations.

FINANCIAL QUESTIONS. The financial committee of the Duma in February was confronted by

serious problems. Under ordinary circumstances it would have been difficult enough to raise stupendous sums for the prosecution of the war; it was doubly difficult since the war had dislocated Russian industry and commerce, and the prohibition of the sale of vodka had deprived the government of the revenue from that source. To supply the deficiency, the finance committee on February 6th recommended the establishment of a government monopoly of tea, tobacco, oil, matches, and insurance. New taxation would help to defray the current ordinary expenses of the administration and cover the interest on the public debt; but to raise the enormous sums disbursed for the conduct of the war, it was necessary to resort to borrowing. In consideration of Russia's financial weakness, France and Great Britain lent valuable assistance in sustaining the credit of the Russian government. In February the Russian finance minister, M. Barck, conferred at Paris with the finance ministers of France and Great Britain, and, as it subsequently appeared, agreed that Russia was to receive very considerable extensions of credit in Paris and in London. The Russian government also received credit to the amount of \$25,000,000, it was reported, from a group of New York bankers.

EFFECTS OF DEFEAT. The defeat of the Russian armies in Galicia in May and June (consult **WAR OF THE NATIONS**) produced a very marked effect upon the political situation in Russia. Patriots accused the military leaders of incompetence and the government of inefficiency. The shortage of munitions, to which the Russian defeat was frequently ascribed, would never have existed, it was alleged, if the minister of war had properly organized the munitions industry. An early reconvening of the Duma and the construction of a really representative "national" ministry were demanded. As far as the high command of the Russian armies was concerned, Grand Duke Nicholas Nicolaievitch still commanded the confidence of the nation; but the retirement of General Ruzsky from the command of the northern armies, and the appointment of General Alexiev as his successor, were regretted in certain quarters; the chief complaint, however, was against some of the less conspicuous generals and against the ministry. As a concession to the government's critics, Premier Goremykin dismissed his unpopular minister of the interior, M. Makarov, and appointed a more liberal statesman, Prince Cherbatov, in his stead. A few days later, June 25th, Gen. W. A. Soukhomlinov, the minister of war, resigned, and was superseded by General Polivanov. Early in July it was reported that the reactionary minister of justice, M. Stcheglovitov, and the procurator of the Holy Synod, M. Sabler, had been replaced by M. Khvostov and M. Samarin, respectively. New assistants were appointed to the minister of war, including General Beliaev and Prince Volkonsky. These changes enabled the cabinet to avoid, or rather to postpone, the impending crisis.

ANNIVERSARY OF THE WAR. On August 1st, the anniversary of the outbreak of war, the Duma assembled to hear a series of notable addresses by M. Rodzianko, president of the Duma, M. Barck, minister of finance, and M. Goremykin, president of the ministerial council. In the eloquent opening address of M. Rodzianko two themes were dominant. First of all, he gave

voice to the tremendous devotion and patriotism of the Russian people, and expressed his belief that "the steel breasts of her sons" would unflinchingly protect "holy Russia" from the enemy. However, and this was the second theme, the government must collaborate with the people in a more democratic spirit. "A change of the spirit itself and the administration of the existing system is necessary." The premier, in one of the most remarkable speeches of the war, frankly admitted that "the war threatens to be protracted and requires ever fresh efforts and sacrifices. . . . That which we have hitherto succeeded in doing is insufficient." As a result of her insufficient preparation for war, Russia labored under a very serious handicap. "The war has shown that we had insufficiently prepared for it in comparison with our foe. Having accumulated, under the treacherous guise of friendship and peace, unlimited stores of military equipment, the enemy attacked us at the moment when he was best prepared in war technique." M. Goremykin in outlining his programme, foreshadowed measures (1) to render additional reserves available for active service, (2) to authorize new loan issues, (3) to "unite in a single institution and materially to extend the share of the representatives of the legislative assemblies, public institutions, and Russian industry in the business of supplying the army with munitions, the guarantee of industrial fuel, and the coördination of measures for the feeding of the army and the country." While he aimed thus to conciliate the Duma by promising it a fuller coöperation in the work of national defense, Premier Goremykin renewed Russia's promise to emancipate the Poles: "His Majesty the Emperor has deigned to authorize me to announce to you, gentlemen of the Duma, that His Majesty has commanded the Council of Ministers to draft a bill to confer upon Poland after the war the right of free organization of her national, cultural, and economic life on the principles of autonomy, under the autocratic sceptre of the Russian ruler, and with the retention of a single imperial authority." Furthermore, in regard to the Jews and other discontented elements within Russia, "our policy must be imbued with the principle of impartial and benevolent attention to the interests of all true citizens of Russia, without distinction of race, language, or religion." Premier Goremykin concluded this appeal for unanimous support with the exclamation: "May there be in Russia for the entire duration of the war no parties save one alone—the party of war to the end—and no programme save one alone—to conquer."

FINANCIAL DIFFICULTIES. At the same historic session of the Duma, Aug. 1, 1915, Minister of Finance Barck summed up the financial difficulties confronting the nation and the plans of the government for their solution. During the first year of the war, he declared, Russia had spent altogether 5,500,000,000 rubles, or about 15,700,000 rubles (about \$8,000,000) a day, for military purposes. For the future, however, the daily expenditure would be not less than 19,000,000 rubles (almost \$10,000,000). The deficit in the budget for the past year amounted to 673,600,000 rubles, principally due to the reduction of the receipts from the liquor traffic. To place the finances upon a sounder basis for the future, the minister advocated an

...the Russian Empire has been ...
...the legislative and the judicial power, as well ...
...the executive, remains in large part in the ...
...hands of the Czar, who bears the title of Em- ...
...peror of all the Russians. The council of the ...
...empire includes an equal number of elected mem- ...
...bers and members nominated by the Czar. There ...
...is a national assembly (Duma) of 446 members ...
...elected indirectly for five years. Reigning Czar, ...
...Nicholas II, born May 6 (18), 1868, succeeded ...
...his father, Alexander III, Oct. 20 (Nov. 1), 1894. ...
...On Nov. 14 (26), 1894, he married Princess Alix ...
...of Hesse. The heir-apparent, Grand Duke ...
...Alexis, was born July 30 (Aug. 12), 1904.

HISTORY

THE FEBRUARY SESSION OF THE DUMA. On Feb. 9, 1915, the Duma was convoked in its first session since the historic debates of August, 1914, at the outbreak of the war. Premier Goremykin expressed unwavering confidence in the ability of the army to achieve ultimate victory. "Our heroic army," he said, "the flower and the pride of Russia, strong as never before in its might, notwithstanding all its losses, grows and strengthens." He dwelt with evident satisfaction on the beneficial results of the abolition of the sale of vodka. With the working classes emancipated from alcohol, he predicted, and with more favorable conditions assured for the exportation of Russian agricultural products, as a result of the war Russia would make mighty strides towards prosperity and wealth. The majority of the Duma appeared to share the premier's optimism; the only sign of dissent was given by a Socialist deputy, who delivered an ill-received demand for peace. The Duma's sitting on the afternoon of February 9th was signalized by a very important speech of the foreign minister, M. Sazanov. After passing in review the events of the past six months, and summarizing once again the circumstances under which Russia had taken up arms in defense of the rights of smaller nations, M. Sazanov pains to deny the stories, which, he said, German diplomats had maliciously

...of speaking in the parliamentary tribune. ...
...said that very this morning, ...
...the Jewish population in the theatre of war ...
...suffering that is an inevitable evil ...
...advantages of regions where hostilities are pro- ...
...ceeding are always severely tried. ...
...statements are unanimous in stating that the ...
...greatest devastation in Poland is the work ...
...of the Germans and Austrians." In respect of ...
...ambitions of Russia for southward expansion ...
...the expense of Turkey, M. Sazanov made the ...
...cryptic but much-quoted statement that ...
...events on the Russo-Turkish frontier while ...
...entering the Russian arms with fresh glory, ...
...bring Russia nearer to the realization of the ...
...political and economic problems bound up ...
...with the question of Russia's access to the open sea. ...
...As for the Armenians, he made the following ...
...promise: "The Russian government disinter- ...
...edly endeavored to alleviate the lot of the ...
...Armenians, and the Russo-Turkish agreement ...
...Jan. 26, 1914, is a historical document in ...
...Turkey recognizes the privileged position ...
...Russia in the Armenian question. When ...
...war ends, this exclusive position of Russia ...
...will be employed by the Imperial government ...
...in a direction favorable to the Armenian people." ...
...M. Sazanov denied that the invasion of Persia ...
...by Russian troops was a violation of Persian ...
...neutrality; he also made the significant decla- ...
...ration that Anglo-Russian relations in the ...
...question were "more than ever based on mutual ...
...and sincere confidence and coöperation, which ...
...are a guarantee of the pacific settlement of ...
...eventual conflict. Russia's relations with Japan ...
...were characterized by the greatest cordiality. ...
...Japan's demands upon China (see CHINA) ...
...obtained nothing contrary to Russian interests. ...
...The sitting was concluded with speeches by ...
...progressist, Octobrist, and Nationalist repre- ...
...sentatives, and the following resolution was ...
...passed by the Duma: "The Duma, saluting the ...
...valorous exploits of our soldiers, sends to the ...
...Russian army and navy a cordial greeting and ...
...to our allies an expression of sincere esteem ...
...and sympathy. It expresses its firm conviction ...
...that the great national and liberating objects ...
...of the present war will be achieved, and declares ...
...its inflexible determination of the Russian ...
...to carry on the war until conditions shall ...
...have been imposed on the enemy assuring the ...
...of Europe and the restoration of right ...
...justice." Before adjourning, the Duma ...
...expressed its desire, (1) that the government ...
...take measures for the relief of provinces ...
...suffering from the effects of the war; (2) that the ...
...government work out a scheme of complementary ...
...work for the support of the children deprived ...
...of their fathers by the war; (3) that military ...
...men doing police duty be summoned to the ...
...colours and replaced by soldiers still capable of ...
...active service; (4) that a commission be ...
...appointed to investigate violations of international ...
...law, the customs of civilized warfare ...
...committed by the Germans. ...
...and to ...

income tax, which could be made "the cornerstone of taxation reform."

PROBATION OF THE DUMA. The central feature of Premier Goremykin's plan to enlist the enthusiastic coöperation of the nation, namely, the creation of advisory boards including experts and delegates from the towns, from the zemstvos, from the Duma, and from the Council of Empire, to assist the ministers of war, commerce, communications, and agriculture, was readily assented to by the Duma. The premier's concessions were not enough, however, to satisfy the more democratic of the nation's representatives, who demanded that the ministry itself should be reorganized so as to coöperate more closely with the Duma. Late in August the leaders of the moderate groups in the Duma and in the Council of Empire conferred together and finally agreed upon a programme of reforms; the first week in September saw the formation of a bloc, including all the groups of the Duma with the exception of the Nationalists and Reactionaries on the Right, and the Social Democrats on the extreme Left, on a platform calling for (1) the reconstruction of the cabinet with a view to the appointment of ministers able to command the nation's confidence; (2) the adoption of a governmental programme calculated to reconcile discontented nationalities and conciliate aggrieved classes; (3) the reform of local administration; (4) the punishment of criminally inefficient commanders and officials; (5) the vigorous prosecution of the war. M. Milinkov became the leader of the reform movement. The "progressive bloc," however, had hardly formulated its programme, when an Imperial ukase was issued, September 16th, unexpectedly suspending the session of the Duma. Protests were heard throughout the country, especially in the larger cities, and in Moscow, where a congress of the zemstvos was in session, against this arbitrary exercise of the prerogative. The action was the more unpopular because the Czar had but a short time before, September 5th, removed the national hero, Grand Duke Nicholas, from the chief command of the Russian army, and sent him to the Caucasus, the Czar himself assuming command of the army.

THE NEW MINISTER OF THE INTERIOR. Early in October Prince Cherbatov was superseded as minister of the interior by Alexis Khvostov, a member of the party of the Extreme Right in the Duma. Obviously the premier was bent upon curbing the liberal spirit which had become so powerful in the recent session of the Duma. M. Khvostov, on October 20th, announced his policy: "We must strengthen the apparatus of authority. We need benevolent but firm authority, which is essential to people of various views and parties who alike love their country. It is necessary in order to facilitate peaceful and productive labor." M. Khvostov was willing, however, to allow a certain amount of liberty to the press and to the labor unions, in consideration of their unquestioned loyalty. One of the main features of his policy, he declared, would be to assure the food supply, and to emancipate Russian industry from its thralldom to German capital, by encouraging the investment of British capital in Russia.

FALSE REPORT OF A CABINET CRISIS. The critical political situation in Russia, with an aged and reactionary premier engaged in a contest with popular opinion, gave rise to a false

rumor early in November, which received widespread credence, that Premier Goremykin had been appointed "Imperial Chancellor," and that the foreign minister, the imperial treasurer, and the minister of agriculture had tendered their resignations. The resignation of the minister of agriculture, M. Krivocheyn, to be sure, was confirmed a few days later, but the resignation of M. Sazanov, and the revival of the office of Imperial Chancellor, were officially denied in *Le Temps*, November 6th. On November 10th, the resignation of M. S. V. Rukhlov, minister of communications, was reported from Petrograd. General Gregoriev, about the same time, was condemned to military degradation and to forced labor for neglecting to take proper measures for the defense of the Kovno fortress.

THE MONGOLIAN AGREEMENT. The protracted negotiations between Russia, China, and Mongolia, with regard to the status of the Chinese Province of Outer Mongolia, were concluded in June, 1915, with the signature of a treaty and a convention, on June 6th-7th, at Khiaikhta, whereby the autonomy of Outer or Western Mongolia was jointly guaranteed by China and Russia. Although the new arrangements marked the success of the Russian policy of virtually detaching Outer Mongolia from China in order that Russian influence might become supreme in the province, nevertheless China was permitted to maintain a shadowy suzerainty over Outer Mongolia, and a Chinese representative, with an ample military guard, was to reside in Urga. In this connection it should be noted that Eastern Inner Mongolia had already been assigned to Japan for exploitation, to all intents and purposes, by the Chino-Japanese treaties of May, 1915. See CHINA.

OTHER EVENTS. For the attitude of the Socialists toward the Russian government, see SOCIALISM. For other information connected with Russian affairs, consult articles WAR OF THE NATIONS, *The Russians in Galicia and Bukovina: January-April*, and *passim*; WITTE; MONGOLIA; and STOKES.

RUSSIAN LITERATURE. Current literature in war-ridden Russia has naturally taken the same course as in all other belligerent countries: there is much less literature being published, and of what is published far less is real literature. The reasons for these qualitative and quantitative changes are obvious; for in Russia, no less than elsewhere, some of the best writers have fallen under the spell of "contemporaneous interest," abandoning literature for war journalism. Many good Russian writers have gone to the front, and of those who resisted the temptation few could close their ears to the din of battle. And, as if to make matters worse for the writers of genuine literature, several thick Russian periodicals—such as *Russkoe Bogatstvo*—in which much of the best literature generally first appears, have suspended publication, while those that still survive give less and less space to *belles lettres*. The results, all told, are anything but encouraging from the literary standpoint. The older and better writers having turned to the production of war literature, the literary novices try very hard—and for the most part in vain—to supply the needs of less ephemeral literature; and it is the industriousness of these writers, whose work in ante-bellum days might go unnoticed if not unpublished, that

helps to create the impression of continuity in present-day Russian literature.

That there was an overabundance of war literature in the year under review, has already been clearly intimated. Its ratio, however, to the more genuine brand has appreciably decreased since 1914, when every day brought forth new poems, new dramas, and new stories crammed full of war impressions or war experiences. While the bulk of this output seldom rose above mere journalism, some of it—the work, in most instances, of well known writers—was nearer literature than journalism.

By far the best work of the latter kind was done during the year by Yakov Okunev, a young writer hitherto unknown, whose collection of war sketches, *With the First Positions*, gives a most vivid picture of warfare as it is actually experienced by the rank-and-file; by S. Kondwueshkin, a maturer writer, whose work shows the great general psychological uplift and transformation resulting from the present national crisis; and by Alexis Tolstoy, a veteran of the pen, whose *At the Front* presents a striking contrast, by its calm and distant attitude, to Okunev's intimate and intense descriptions. But just as many good war correspondents fail in deliberate war sketches, so many of the best writers of *belles lettres* make a poor showing as war correspondents. Okunev is an example of the former, and Tolstoy and Chirikov of the latter.

Between semi-literary war sketches and literature dealing with war situations the line is hard to draw. Here we have Lensky's *The Heart of Man*, an excellent story with a war setting, and full of human interest; Tolstoy's *On the Mountain and The Average Man*, excellent impressionist pictures of the sobering spiritual effects of the war; Boris Zaitsev's unsurpassed bit of realism, *Mother and Kate*; F. Kryukov's *Costly Graves*, a story centring about evangelical love aroused in a Red Cross nurse by the war; Ivan Shmelev's *Trying Days*, a hasty piece of work from a first-class writer, depicting the general reaction of the people to the great calamity; Artsybashev's *The Jew*, a story rendered worthless by a deliberate attempt to drag in war atmosphere; and, of course, no end of others. If to this list of contemporaneous fiction we add several dramatic works—such as Tolstoy's comedy, *On the Day of Battle*, and Artsybashev's *War*—the enumeration of the more characteristic war literature will be practically complete, for in poetry and other departments of Russian literature the war has so far yielded little of distinctly contemporaneous importance.

When we turn from war literature to less ephemeral work, the list, as might be inferred, is shorter but much better. Beginning with fiction, by far the most important literary event of the year was the completion of Kuprin's three-volume novel, *The Pit*, begun in 1909. This somewhat Zolaesque work, a sympathetic picture of prostitution relieved by an element of uplifting idealism, has provoked considerable discussion by its boldness and uniqueness. Less sensational novels were Potapenko's serial *New Blood*, an intensely interesting story up to the author's best work; N. Krashenninikov's *Amelia*, a story of childhood and youth concerned with racial affinity; and S. Chevkin's *Vostrov and Son*, in which the author wrestles with the old problem of "the two generations" from a somewhat new point of view. Besides these, special

mention should here be made of Gorky's *All Over Russia*, a collection of stories in his best vein; and K. Trennev's *His Excellency*, an unusually interesting collection of stories by a very promising new writer, dealing with the provincial life of South Russia.

To dramatic literature the year has made at least two noteworthy contributions—*The Green Circle*, by Z. N. Hippus, and *Signs of Autumn*, by I. Surgutchev. The former is a meritorious, if unconvincing, picture of the younger generation, still very green, that has come up into conscious being since the revolutionary days of 1905; and the latter, an original and powerful psychological comedy involving imaginary marital infidelity. Both have proved great literary and theatrical successes and have naturally provoked much discussion. In this connection, it is worth noting that the most successful plays produced in Russia during the year were not war plays, but true classic drama; that, while such mediocre things as Andriev's *For King, Law, and Liberty*, and Artsybashev's *War* soon tired Russian audiences, revivals of Dostoyevsky, Pushkin, Turgenev, Shchedrin, Calderon, and Oscar Wilde proved deservedly popular. It would seem that Russia's stay-at-homes seek the distraction of the theatre to forget the woes of war. At any rate, the tendency to turn for comfort and consolation to old literary masters promises well for post-bellum literature in Russia.

The annual collections of verse, still few in number, to be sure, suffered no qualitative falling off in 1915, when all the tried and true contemporary Russian poets were represented by one volume or more. It is difficult to single out the very best of these, for the choice lies among Feodor Sologub (*War*), Ivan Bunin (*The Cup of Love*), and Alexander Bloch (*Poems on Russia*)—all poets of the first rank and each, under stress of intense national emotion, having seemingly excelled himself. While most of this poetry was naturally inspired by the great crisis, all of it is remarkably free from cheap sentimentalism and national hysteria of any kind. Along with these collections, mention should be made here of a new edition (the 6th) of Vladimir Soloviov's excellent *Poems*.

Among the reminiscent literature of the year, Chekhov's fifth posthumous volume of letters is undoubtedly the most important. Next come the *Turgenev Sbornik* ("collection"), edited by N. K. Piskanov, which sheds much new and invaluable light on the life of the greatest Russian novelist; and the *Memoirs of Sergei Mikhailovitch Soloviov*, which furnishes precious material for biographers and literary historians. Here, too, should be included Gorky's *My Childhood*, an important and very interesting autobiography already available in an English translation.

Of the other important works published in the last twelve-month, space permits but the mention of *The Children and the War*, a very interesting symposium by a number of educational writers; Aikhenvald's *About Chekhov*, an important critical-biographical study called forth by the above-mentioned new Chekhov volume; Tugendkhold's *Problems and Characteristics*, an interesting collection of literary and critical papers; Kariev's *Historiology*, a valuable discussion of the theory of the historical process; Fersov's *Peter the Third and Catherine the Second*; Borodkin's *History of Finland in the*

Time of Nicholas the First; and Vengerov's four-volume *Russian Literature in the Twentieth Century*, a scholarly compilation on original lines composed of numerous critical essays and semi-autobiographical studies.

In conclusion, we might call attention to the revival of interest in Russian literature in English-speaking countries, due, no doubt, to the new general interest in all things Russian stimulated by the present war. This was shown during the year by the numerous new translations and new editions of Russian works. The list includes, besides some sensational things by Andreév and Artsybashev, Chekhov's *Russian Silhouettes*; Dostoyevsky's *The House of the Dead*; Gogol's *Taras Bulba*, and *Dead Souls*; Gontcharov's *Oblomov*; Gorky's *Tales of Two Countries* and the autobiography already mentioned; Lermontov's *A Hero of Our Time*; and Feodor Sologub's *Sweet Scented Name and Other Fairy Tales*, and *The Old House and Other Tales*. That such a list speaks well for the taste of English readers goes without saying.

RUTGERS COLLEGE. An institution for higher education, founded in 1766, at New Brunswick, N. J. The total enrollment in all departments in the autumn of 1915 was 485. This is exclusive of the summer session and short courses, which would make a total of about 1200. The faculty numbered about 60, exclusive of extra instructors for the summer session and short courses. There were no notable changes in the membership of the faculty during the year. In 1915 the John Howard Ford dormitory was completed and furnished at a cost of about \$125,000. Other gifts were received to the amount of about \$50,000. The library contained about 80,000 volumes.

RYE. Practically all of the world's rye crop is produced in the Northern Hemisphere, the average for the five-year period, 1910-14, according to estimates by the International Institute of Agriculture, amounting to 99.9 per cent of the total production. In considering the world's crop, therefore, figures are approximately correct even though the yield of the Southern Hemisphere is disregarded. Although rye production has undergone a marked increase south of the equator since 1910, the average total production for the last five harvests amounted to only 1,682,000 bushels. Estimates from the source above mentioned placed the production of rye in the Northern Hemisphere in 1915 at 1,898,140,000 bushels, or over 10 per cent greater than in 1914, 6.5 per cent above the five-year average, and 15.3 per cent above the average for the last 10 years. Official data on the rye crop of 1915 were not reported by most of the countries engaged in the European war as well as a number of neutral countries, and in the estimate of the world's production the yields of these countries were taken as the average for the last five years and in some instances for only four years, the four-year average being assumed as representing also the yield in 1914. Only about 57 per cent of the estimate of the world's rye crop in 1915 was based on official data pertaining to the crop of the year. The consumption of rye during the year 1915-16 in the Northern Hemisphere as based on the average consumption for the years 1910-11 to 1914-15, inclusive, was estimated at 1,763,343,000 bushels, so that the production of 1915 appeared fully adequate to meet the year's requirements. International

commerce in rye had practically ceased in 1915. In common with wheat and other cereals, the exportation of rye was prohibited by all belligerent nations as well as by many neutral countries. According to data published by the Department of Agriculture, the United States produced 49,190,000 bushels of rye on 2,856,000 acres, or at the rate of 17.2 bushels per acre, and the total value of the crop, based on the farm value per bushel on December 1st, amounted to \$41,295,000. All of these figures constituted records in the rye production of the country. The rye crop of Canada amounted to 2,478,500 bushels from 112,300 acres, the rate of yield being 22.07 bushels per acre, as compared with about 16 bushels in 1914.

SAFETY AT SEA. In addition to the account of the *Eastland* disaster, which is fully treated here, information on this subject will be found in the articles *LUSITANIA*, *NAVAL PROGRESS*, and under *UNITED STATES AND THE WAR*.

EASTLAND DISASTER. The excursion steamer *Eastland*, while moored alongside of a wharf in the Chicago River, capsized on Saturday morning, July 24, 1915, and some 1500 persons were either thrown into the water or were imprisoned within the boat. Eight hundred and twelve lives were lost. The *Eastland* was a steel hull lake vessel, built in 1902, 265 feet in length, 38 feet beam, 23 feet draft, and net tonnage 1218. She had been used for several years in excursion business from Chicago to South Haven, Mich., and for five years was in excursion service at Cleveland, Ohio. Built on fine lines for high speed, the *Eastland* bore a reputation for lack of stability which was well justified. On the morning of the accident the passengers, most of them employees of the Western Electric Company, had gone aboard the craft for a day's excursion on the lake. There was no ballast in the tanks when the boat arrived at the Clark Street dock, and as she had a list to starboard the engineer started to fill the tanks, No. 2 and 3, on the port side, there being five ballast tanks on each side of the vessel. As the passengers crowded on the boat the load shifted so as to give a list to port and the engineer attempted to pump out tank No. 3. As the boat did not then right herself, he attempted to fill the tank on the starboard side, but it was too late, as not only was most of the ballast on the port side, but it was on this side apparently that the crowd of people predominated. The result was that the boat gradually listed away from the wharf, snapped the hawsers, and turned over, throwing the passengers, many of whom were on the upper decks, into the river. The scene that followed the disaster was indescribable. All available boats were impressed for saving the passengers in the water, while oxyacetylene torches were put to work to cut holes through the plates so as to rescue those imprisoned within. Few, however, were saved alive, except those that were taken immediately from the water, and the loss of life came from drowning and suffocation.

This disaster occasioned much discussion, both on the part of the general public and the engineering profession. Indictments for manslaughter were returned against the officials of the owning company and the captain and engineer of the ship, the latter being accused of criminal negligence in the handling of the vessel, passen-

gers, and ballast. The Government Inspection Service was criticised both by the Cook County grand jury and by the public at large and through the daily press, and a large number of inquiries were set on foot to apportion the blame, and to secure the punishment of those guilty, and to render similar accidents impossible in the future. It was generally admitted that the underlying cause of the disaster was the design of the vessel, her general construction, and especially that of her ballast tanks. The *Eastland*, like other boats in passenger service in the United States, was lacking in stability, and although this condition previously had been pointed out, the conditions governing the inspection and license made it impossible to prevent the use of such vessels. It was claimed that fixed ballast sufficient for proper stability should have been required by the inspectors and owners of the vessel, and that the tanks used for trimming purposes were not sufficient, especially as under such conditions the safety of the boat depended very largely on the quick wit and the judgment of the engineer and the captain, and the proper operating condition of the valves, pumps, and sea cock, any one of which could easily have been clogged and rendered possible such a disaster.

There was general criticism on the work of government inspectors, and in some cases it was stated that these officials, particularly on inland waters, were not technically trained men competent to make stability calculations, to conduct inclining tests, and to determine the stability of a vessel in various loading and other service conditions. It was further stated that the filing of plans for boats to be built or reconstructed with the Steamship Inspection Service had only been required within a few years, and that no such plans of the *Eastland* were on record.

Three weeks were required to raise the wrecked excursion steamer *Eastland* to an approximately upright position, as it was necessary first to seal the openings under water and then pump the water from the hull, floating the steamer with the aid of pontoons which were filled with water. Cables slung between the pontoons were passed beneath the vessel. On removing the water from the pontoons, the *Eastland* was slowly raised and floated after four hours, so that she could be removed and towed to the ship yard. The vessel was then repaired, and was sold, being eventually turned over to the uses of the naval militia of the State of Illinois.

ST. CHRISTOPHER. See ST. KITTS AND NEVIS.

ST. HELENA. An island in the south Atlantic Ocean; a British possession. Area, 47 square miles; population (1911 census), 3520. The capital and only town is Jamestown (1439 inhabitants). Imports (1913), £43,394; exports, £7568; shipping entered and cleared, 200,462 tons; revenue, £11,411; expenditure, £10,632. Steamers arrive from England every four weeks, the time from Southampton being 17 days.

ST. KITTS AND NEVIS. A presidency of the Leeward Islands colony, consisting of the islands of St. Kitts (or St. Christopher, 67 square miles), Nevis (50 square miles), and Anguilla (35 square miles), with their dependencies. Basseterre, the capital, in St. Kitts, has over 8000 inhabitants; Charlestown, the principal town in Nevis, about 1500. The main indus-

try of the islands is the production of sugar, molasses, and rum. Salt and cotton also are exported. Trade and finance statistics are given in the following table:

	1907-8	1908-10	1910-11	1913-14
Imports	£180,347	£172,220	£195,277	£200,036
Exports	189,903	182,446	205,693	203,626
Revenue	50,885	48,112	52,748	58,880
Expenditure ...	47,170	48,689	49,872	55,081
Shipping *	620,435	592,982	625,686	560,628

* Tonnage entered and cleared.

See LEEWARD ISLANDS.

ST. LUCIA. A British West Indian island; one of the Windward Islands colonies. Area, 233 square miles; population in 1911, 48,637. The capital is Castries, with 6266 inhabitants; Soufrière has about 2300. Most of the inhabitants speak a French patois. The chief products are sugar, cacao, logwood, spices, rubber, and limes. The island has a much exaggerated reputation for unhealthfulness (the death rate being about 20 per 1000) and for a superabundance of reptiles. Trade and finance statistics are given in the following table:

	1907-8	1908-10	1910-11	1913-14
Imports * ..	£310,809	£266,227	£277,208	£288,405
Exports	264,402	250,674	238,955	274,459
Revenue	67,851	65,739	65,066	67,490
Expend.	64,840	64,446	67,288	68,858
Shipping † ..	2,627,218	2,515,914	2,792,359	3,546,690

* Trade figures are for calendar, financial for fiscal years. † In tons entered and cleared.

SAINT-PIERRE AND MIQUELON. Islands off the southeastern coast of Newfoundland, which, with a number of islets, constitute a French colony. Area, 241 square kilometers (93 square miles); population in 1911, 4209. Imports and exports (1912), 5,179,422 and 6,002,982 francs, respectively. In 1911 the budget balanced at 503,000 francs.

ST. THOMAS. See SÃO THOMÉ AND PRINCE; and DANISH WEST INDIES.

ST. VINCENT. A British West Indian island; one of the Windward Islands colonies. It occupies between 140 and 150 square miles, and had, in 1911, 41,877 inhabitants (estimate of March 31, 1912, 43,117; March 31, 1913, 44,434; March 31, 1914, 45,605). Kingstown, a port of registry situated at the southwestern extremity of the island, had 4300 inhabitants in 1911. Other towns are Georgetown and Barrouallie. St. Vincent is of volcanic origin; the Soufrière was in eruption intermittently during 1902, and in March, 1903. The Grenadines, a chain of small islands, chief of which is Bequia, are comprised in the government of St. Vincent. Products for export are sugar, rum, cacao, arrow root, ground nuts, and spices. Trade (for calendar years) and financial (fiscal years) statistics follow:

	1910-11	1911-12	1912-13	1913-14
Imports	£97,787	£110,926	£129,142	£122,886
Exports	101,180	118,625	111,684	115,201
Revenue	30,125	34,852	38,088	34,973
Expenditure ...	30,843	38,785	33,998	38,178
Shipping *	290,917	298,976	322,449	278,789

* Tonnage entered and cleared.

SAKHALIN. An island off the eastern coast of Siberia, divided by the 50th parallel, between Russia and Japan. The Russian portion consti-

tutes a province, with an estimated area of 14,668 square miles and a population of about 14,500. Japanese Sakhalin, called Karafuto, has an area estimated at 13,155 square miles; its population in 1914 was 49,463, mostly Japanese. Coal and alluvial gold occur, and there are large forests of coniferous trees. At present the most important industry is the herring fishing, but the government encourages the development of agriculture.

SALT SOLUTION. See ANTISEPTICS.

SALZBURG. See AUSTRIA-HUNGARY.

SALVADOR. A republic of Central America, situated on the Pacific Coast and bounded by Guatemala and Honduras. The capital is San Salvador.

AREA, POPULATION, ETC. The area, according to a planimetric calculation, is 21,160 square kilometers (8170 square miles), an area slightly smaller than the State of New Jersey. The population in 1914 was calculated at 1,254,121. Nearly two-thirds of the people are mestizos and nearly one-sixth Indians. Although the white element is small, the republic has achieved a considerable degree of economic development and political stability. Town populations have been recently reported as follows: San Salvador, 64,694; Santa Ana, 59,421; San Miguel, 29,874; Zacatecoluca, 25,964; San Vicente, 25,370; Ahuachupán, 24,151; Chalchuapa, 23,398; Nueva San Salvador, 22,101. Marriages in 1913 and 1914, 4762 and 4013; births, 50,996 and 51,859; deaths, 25,141 and 25,413. Illiteracy is common. The government has undertaken to increase the number and improve the character of the public schools. In 1913 there were 711 government primary schools; the total number of primary schools was 856, with an enrollment of 50,550 pupils and an average attendance of 38,121.

PRODUCTION AND COMMERCE. Salvador's leading crop is coffee. The reported yield in 1914 was 770,000 quintals, of which 643,087 were exported. Other agricultural products are cacao, bananas, sugar cane, rice, tobacco, and indigo. Rubber and balsam also are produced. The minerals include gold, silver, copper, iron, and mercury. Mining, especially that of gold and silver, is increasing in importance.

In 1913 imports were valued at \$6,173,545 and exports at 23,527,782 pesos (silver); in 1914, imports, \$4,958,614, and exports, 26,991,237 pesos. The peso in 1913 was worth about 42.2 cents, and in 1914 about 36.5 cents. The principal imports are cotton goods, hardware, drugs and medicines, machinery, and flour. Leading exports in 1914: coffee, clean, 21,950,900 pesos; coffee in parchment, 593,352; gold bullion, 1,284,666; gold and silver ore, 1,905,334; auriferous silver, 261,464; cattle hides, 121,353. The exports go mostly to the United States, Germany (until the war), France, and Italy. The imports come chiefly from the United States (\$2,027,732 in 1914) and the United Kingdom (\$1,283,636).

COMMUNICATIONS. Salvador has more than 2000 miles of good roads. The railway in operation in 1914 is reported at 425 kilometers (264 miles). Telegraphs in 1914, 215 offices, with 3877 kilometers of line; post offices, 117.

FINANCE. The silver peso was worth about 44.5 cents in 1912, 42.2 in 1913, 36.5 in 1914. Revenue and expenditure in 1913 amounted to 13,734,133 and 16,178,910 pesos respectively; in 1914, 12,422,753 and 15,085,219. Import duties

constitute somewhat more than half the total receipts. The largest expenditures are for the public debt, war, and the departments of the interior and fomento. For the fiscal year 1916, the estimated revenue was 12,064,900 pesos, and the estimated expenditure, 12,373,503 pesos. Public debt Jan. 1, 1914: foreign, 15,565,610 pesos; internal, 8,485,837; treasury bonds, 3,841,812; total, 27,893,259.

GOVERNMENT. The legislative power is vested in a single chamber, the National Assembly, consisting of 42 members (3 from each of the 14 departments) elected annually by direct vote. The President with a Vice-President, is elected by direct vote for four years. Upon the resignation of the President, Carlos Meléndez, Alfonso Quirón Molina became President on Aug. 29, 1914, for the remainder of the term, ending March 1, 1915. Meléndez and Quirón Molina were elected President and Vice-President respectively, and were inaugurated March 1, 1915.

SALVARSAN AND NEOSALVARSAN.

The supply of these drugs was practically cut off by the war and substitutes were sought. Two of these, one made in Great Britain, and the other in France, are kharsivan and neokharsivan, and nevarsenobenzol ("Billon"). These drugs, although chemically identical with the original salvarsan and neosalvarsan and reported to be slightly more toxic, are believed to be not as efficacious as the preparation of Ehrlich.

Intraspinal medication is one of the most notable achievements of modern medicine, although the clinicians are as yet at variance as to the best method of employment. Enough remarkable reports of improvement and cure of syphilitic affections of the nervous system by the intraspinal injection of salvarsanized serum have been made to warrant a thorough trying out of the method, especially where other medication has failed. According to Hough: "The researches of Ehrlich and others have shown that salvarsanized serum has a distinct power of killing the spirochetes, greater than that exercised by salvarsan itself." It seems certain that the syphilitic process can be arrested, but it is equally certain that nerve tissue, which has been destroyed, cannot be restored by any treatment.

SALVATION ARMY. There were in 1915 in the United States and its possessions 2961 ministers, 941 places of worship, and 27,664 communicants, a gain of 53 ministers, 37 places of worship, and 207 communicants over 1914. The United States is divided into two departments. The national headquarters are in New York City, and the headquarters of the department of the Western States are in Chicago. For the year ended Sept. 30, 1914, there were 904 corps and outposts, 190,836 indoor meetings, with an attendance of 7,593,337; open-air meetings, 152,567, with an attendance of 16,977,293; converts, 49,112; local officers and bandmen, 6562; company attendance, 1,151,011; junior meetings, 67,950, with an attendance of 1,807,000; numbers of the *War Cry* published, 3,974,758; workingmen's hotels, 85, with accommodation for 7221; industrial homes, 139; children's homes, 5; rescue and maternity homes, 34. In the slum work there were 16 posts, 33,923 families visited, 8 nurseries, and 46,574 children sheltered. In prison work there were 11,498 hours spent in visiting, 29,526 prisoners prayed with and ad-

vised, 2100 assisted on discharge, and 413 situations found.

There were in the world in June, 1914, 58 countries and colonies occupied; there was preaching in 36 languages; there were 9698 corps and outposts, 1191 social institutions, and 16,519 officers and cadets.

SAMOA. See GERMAN SAMOA.

SAMOS. One of the Anatolian islands. Formerly it was a principality, autonomous, but tributary to the Porte in the annual sum of 200,000 piasters. In November, 1912, the National Assembly of Samos proclaimed the union of the island with Greece; and in March, 1913, the island was occupied by Greek troops, and has since been administered through a Greek prefect—J. Hadjiloucas in 1915. The area is stated at 468 square kilometers (181 square miles). Recent population figures are not available, but in 1902 the inhabitants, who are mostly Orthodox, numbered 53,424, exclusive of some 15,000 natives of Samos living on the Anatolian mainland. The capital is Vathy, with about 8000 inhabitants. For 1909 the reported value of imports was 29,673,545 piasters, and of exports, 27,835,312 piasters; for 1911, imports, 37,036,352 piasters and exports, 19,741,212 (wine, 8,595,000; tobacco, 2,875,000; leather, 2,764,000; cigarettes, 1,492,000). The budget estimates for 1910 were 3,651,660 piasters revenue, and 3,627,496 piasters expenditure; public debt, 2,570,500 piasters.

SAN DIEGO EXPOSITION. See EXPOSITIONS.

SANITATION. See ENTOMOLOGY; GARBAGE AND REFUSE DISPOSAL; HYGIENE; INSECTS, PROPAGATION OF DISEASE BY; MILITARY PROGRESS; PROSTITUTION; SEWAGE PURIFICATION; SEWERAGE; SMOKE ABATEMENT; STREET CLEANING; WATER PURIFICATION.

SANSKRIT. See PHILOLOGY, MODERN.

SANTO DOMINGO. See DOMINICAN REPUBLIC.

SÃO THOMÉ AND PRINCIPE. Two islands off the coast of French Equatorial Africa, composing a Portuguese colony. Area, 939 square kilometers (363 square miles); population (1909), 68,221. Cacao is the principal product of the islands, their output constituting a large part of the world's supply. Owing, however, to foreign interference with the system of coercion of indentured laborers, the trade has fallen off. Total imports in 1909, 2,912,035 escudos; exports, 8,150,632; in 1910, 3,197,830 and 9,896,000; in 1913, 1,727,478 and 7,245,027. Revenue in 1909-10, 931,429 escudos; expenditure, 703,315; 1913-14 (budget), 1,028,305 and 912,092.

SARATOGA SPRINGS. The city charter obtained during the year puts the government of this resort on a better footing, and assures closer coöperation of city with State in the utilization of the mineral waters. The charming city park of 10 acres, miles of beautifully shaded streets, excellent stone or asphalt surfaced roads leading to Lakes Luzerne, George, and Saratoga, as well as to the historic points in old Saratoga, combine to offer attractions that were more popular this year than for over a decade. The Commissioners of the State Reservation were able to show more on the surface of the work that has gone forward for six years in preparing the Lincoln Park of 60 acres and the Geyser Park of 260 acres available for the use of invalids, with walks and climbs for the

Stokes-Oertel exercise. The funds for the elaborate bath house, which the State will eventually erect, not being available, the old Lincoln Spring house was equipped for baths and neurovascular training, massage, and colon irrigation, and with rest rooms, so that 400 treatments could be given during the choicest hours of the day. A private bath house was bought and refitted and renovated, so that the same treatments could be given, except colons, and with facilities also for general hydrotherapy and electric light treatment. This house also offers Turkish and Russian baths, and a swimming pool indoors. Two swimming pools were constructed out of doors at the Lincoln bath house. Over 10,000 baths were given during the short 1915 season. It is proposed to have a "cure" season from May 1st to July 31st, a racing season for August, and a "cure" season from September 1st to December 1st. The Congress spring has been restored, and is available in a beautiful sunken garden in the city park. The Hathorn, Coessa, and Orenda cathartic waters and the Minnonebe and Geyser table waters are bottled, and the Karista and Columbian iron springs are available at their sources, as well as many others. The commissioners are: Frederick W. Cameron, George C. Van Tuyl, Jr., and Frank N. Godfrey, who serve without compensation. The staff is composed of Dr. Albert Warren Ferris, director; Charles G. Anthony, consulting engineer; Herbert Ant, chemist; and Louis W. Noland, secretary. See also HYGIENE.

SARAWAK. The northwestern portion of the Island of Borneo; a British protectorate. The area is about 42,000 square miles; population, about 500,000—no census has ever been taken. The capital is Kuching (25,000 inhabitants); Sibu has a large Chinese population, mostly traders, and the Rejang River has a raft population of some 90,000. Chinese are employed in the gold mines of Paku and the Batang Lupar Residency. Gold export, 1912, 1,070,200 Straits Settlements dollars (1910, 951,119 dollars); 1909, 1,139,440 dollars; 1906, 1,415,470; 1903, 1,784,600. Coal output, 1912, 39,588 tons (1910, 32,073 tons). The export of timber in 1912 was valued at 27,891 dollars (1910, 25,241 dollars). Statistics below are in Straits Settlements dollars (shipping in tons entered and cleared):

	1907	1909	1911	1913
Imports	7,821,766	7,811,556	8,572,624	8,299,458
Exports	8,220,896	8,098,142	9,563,485	8,865,158
Revenue	1,441,195	1,846,962	1,420,420	1,462,082
Expenditure	1,859,274	1,152,787	1,841,761	1,899,481
Shipping	110,726	111,907	58,856	68,874

Rajah, Sir Charles Johnson Brooke (born 1829); acting, Charles Vyner Brooke (Rajah Muda), the heir (born 1874).

SARRAIL, MAURICE. A French soldier. He had held various commands before 1913, when he was in charge of an infantry division in the sixth army corps at Reims. When the great European war broke out in 1914, he was placed in command of the troops in the Argonne. He was then placed in command of the third army based on Verdun. In the retreat to the Marne, General Joffre (q.v.) depended on Sarrail for the execution of many of his pivotal maneuvers. Although he commanded inferior forces, he later held the Crown Prince of Germany on the Meuse, while other armies

were fighting the battle of the Marne. In this manner he kept the fortress of Verdun from falling into German hands. In August, 1915, when Gen. H. J. E. Gouraud was incapacitated, Sarrail succeeded him as commander in chief of the army in the Near East. This consisted of the French expeditionary force fighting in the Dardanelles campaign. Later in the same year he was appointed commander in chief of the allied expeditionary force which landed at Saloniki, Greece, to stem the Teutonic drive through the Balkans. He arrested the consuls from Germany, Austria-Hungary, and Bulgaria stationed at Saloniki, and confined them on a French war vessel. See **WAR OF THE NATIONS**.

SARRIEN, JEAN MARIE FERDINAND. French statesman, died Nov. 28, 1915. He was born in 1840, and in the Franco-German War served as a captain of militia. In 1876 he was elected to the Chamber of Deputies, and became minister of posts and telegraphs in 1885; minister of interior in 1887; vice-president in the Chamber of Deputies in 1896; minister of the interior again in 1898; and minister of justice in the same year. In 1906 he was a candidate for the presidency of the Chamber of Deputies, but was defeated. He was also defeated as a candidate for the presidency of the republic, by M. Fallières. In 1906 he served as premier, but took no active part in politics after that date.

SASKATCHEWAN. A province of the Dominion of Canada, established Sept. 1, 1905. The area is 251,700 square miles, more than six times as large as Ohio. Population at the 1911 census, 492,432; 1914 estimate, 691,000. The capital is Regina, which had in 1914 an estimated population of 50,000. Estimated population of Moosejaw in 1914, 30,000; Saskatoon, 30,000; Prince Albert, 15,000. Saskatchewan is administered by a Lieutenant-Governor, who is appointed by the Governor-General of the Dominion and who acts through a responsible executive council. There is a unicameral Legislative Assembly of 55 members, elected for five years. In 1915 Richard S. Lake was appointed Lieutenant-Governor in succession to George William Brown. Premier and minister of education in 1915, Walter Scott. See **CANADA**.

SAULTE STE. MARIE CANALS. See **CANALS**.

SAVINGS BANK INSURANCE. See **INSURANCE**.

SAVINGS BANKS. The commercial savings banks of the United States are of two classes, mutual and stock; postal savings banks are treated separately below. The mutual savings banks are found almost exclusively in New England and the Eastern States. In 1915 there were 2159 stock and mutual savings banks in the United States with nearly 10,000,000 depositors and approximately \$5,000,000,000 in individual deposits. Since the year 1916 is to be commemorated by the savings bank section of the American Bankers' Association as the centenary of the establishment of the first savings bank in the United States it is of interest to note that in 1820 there were 10 savings banks with 8635 depositors and \$1,138,000 deposits. The savings bank section planned a campaign of education in thrift for 1916 partly for its general popular effects and partly to increase the supply of capital available for industrial and commercial expansion.

The mutual institutions numbered 639, of

which nearly two-thirds were in New England and all of the remainder in the Eastern States except 21 in Middle Western States, 1 in California, and 1 in West Virginia. Their depositors numbered nearly 9,000,000 and the savings accounts aggregated \$3,950,000,000. The stock savings banks which are found in greatest numbers in Middle Western and Western States numbered 1529. Their depositors numbered about 650,000 and their aggregate deposits were \$1,047,000,000. Of all savings bank depositors nearly 4,000,000 were in New England and about 3,250,000 in New York; or 70 per cent of all depositors were in these seven States, and they were credited with nearly 75 per cent of all savings bank deposits.

POSTAL SAVINGS BANKS. According to the report of the Postmaster General there were 9546 postal savings depositories in operation in the United States on June 30, 1915. The total deposits were \$65,684,000, as compared with \$43,444,000 on June 30, 1914, an increase of 51.2 per cent. The number of depositors increased from 388,511 on June 30, 1914, to 525,414 on June 30, 1915, an increase of 35.2 per cent; and the average deposit which was only \$57 in 1911 increased from \$112 in 1914 to \$125 in 1915. The system had \$80,086,000 at interest in 6007 national and State banks on June 30, 1915. The interest received from banks during the year amounted to \$1,258,000; and that granted depositors was \$613,700. There were put out during the year the eighth and ninth issues of postal savings bonds, making the total of such issues, \$6,260,000 of registered bonds, and \$1,046,000 of coupon bonds. During 1915 the amount of deposits surrendered for bonds was \$1,799,000. Experience showed that the system of selling postal savings cards and stamps for 10 cents each was amply justified, especially for school children, since \$640,410 of cards and stamps had been sold since the system started, \$157,424 being sold in 1915. It was found that with reference to the nativity of depositors, 58.7 per cent of them were born outside of the United States, and that this foreign group owned 71.8 per cent of the total deposits. Natives of Russia owned 20.7 per cent of the total; Italians, 14.2 per cent; British, including British colonists, 8.8 per cent; Austrians, 8.7 per cent; Hungarians, 4.3 per cent; Germans, 4.1 per cent; Swedes, 2.2 per cent; and Greeks, 1.8 per cent. The seven cities with more than a million deposits on June 30, 1915, with the number of depositors and balance to their credit were as follows: New York, 108,274, \$13,154,695; Brooklyn, 38,024, \$4,012,252; Chicago, 22,524, \$3,267,532; Boston, 15,351, \$1,619,706; Detroit, 8338, \$1,158,023; San Francisco, 7794, \$1,082,257; and Portland, Oreg., 7231, \$1,004,599.

As a result of vigorous urging by the Postmaster-General, Congress raised the limit of the maximum deposit from \$500 to \$1000; but this change was vetoed by the President because the Senate had included an amendment which enabled State banks and trust companies to receive postal savings deposits whether or not they were members of the Federal Reserve system. The Postmaster-General had advocated that the maximum deposit be raised to \$2000, with the proviso that interest should not be paid on more than \$1000 for any one account. It was generally agreed that the \$500 limit, which was purely experimental, was too low, and that if increased

it would have the effect of restoring to circulation much of the \$50,000,000 estimated to be secreted by foreigners. When the system was first introduced it was opposed by bankers on the ground that it would withdraw money from the regular channels of trade; but the American Bankers' Association later declared officially that there had been no complaint anywhere on this score. The deposits are restored to regular financial channels by being deposited in national and State banks which are government depositories. In 1915 deposits were made in 3628 national, 1499 State, 291 savings, and 21 private banks and 568 loan and trust companies. According to the Postmaster-General's estimate fully \$10,000,000 were added to the deposits as a direct result of the war, between August, 1914, and April, 1915.

SAVINGS BANKS, POSTAL. See **SAVINGS BANKS, Postal Savings Banks.**

SAWYER, ROLLIN AUGUSTUS. An American Presbyterian clergyman and writer, died Jan. 18, 1915. He was born in Sawyerville, Quebec, Canada, in 1830. In 1841 he removed to Ohio, where he graduated from Western Reserve College in 1851. For the four years following he was principal of the Granville Academy. He graduated from the Union Theological Seminary in 1857, and in the following year was ordained in the Presbyterian ministry. He filled pastorates in several cities in New York, Ohio, and Connecticut. From 1893 to 1908 he was lecturer on literature in the Bloomfield Theological Seminary. He was for many years contributing editor of the *New York Evangelist*, and the *Christian at Work*. He served as presiding officer in three synods of the Presbyterian Church. He was the author of many published sermons and addresses.

SAXONY. See **GERMANY.**

SCABIES. See **VETERINARY MEDICINE.**

SCANDINAVIAN LITERATURE. At present Scandinavian literature is at an ebb, due partly, perhaps, to the distractions of the European war, but certainly to some extent also to conditions inherent in the Scandinavian countries themselves. Comparatively little creative genius has of late manifested itself in the field of letters. Within a few years the writers of towering greatness have been lost by death; the older writers who still remain are for the most part silent, and of the younger generation but few have given us any works of noteworthy promise. The literary efforts of to-day are looking toward the past: we find an increase in memoirs, editions of letters, and biographical works. Particularly do we notice a constantly increasing interest in literary history and literary criticism, and an abundance of translations—even from one Scandinavian language to another.

DANISH. Drama. In his tragedy *Ønsket* (*The Wish*), treating the Faust theme, the well-known Icelandic dramatist, Jóhann Sigurjónsson (see **ICELANDIC LITERATURE**, **NEW INTERNATIONAL ENCYCLOPEDIA**, second edition, vol. 11), succeeds in making the old Icelandic intellectual and religious life with all its superstitions live again before us. Niels Hoffmeyer's *En lille Mor* (*A Little Mother*) is based on the Pyramus and Thisbe theme. Its sentimentality is greater than its dramatic power. In Einar Christiansen's *Manden paa Højris* (*The Man at Højris*), an endeavor at portraying peasant life, the conflict is

brought about by the jealousy between father and son.

Fiction. Johannes Buchholtz made a very promising début with *Egholms Gud* (*Egholm's God*), which reminds us of the days of naturalism. The hero, who in many ways resembles Ekdal in Ibsen's *Wild Duck*, is his own god. In Thit Jensen's *Stærkere end Tro* (*Stronger Than Faith*), we read the tragic story of a powerful and apparently successful clergyman, whose downfall is caused by his sexual passion, which proves stronger than his faith. Christian Houmark's *Veje, der skilles* (*Parting Ways*) tells the story, often found in Scandinavian literature, of a man who deserts the girl whom he has seduced in order to marry in his own station in life.

Science, Literature, etc. The first volume of a series dealing with historical subjects, *Gemt og glemt* (*Things Hidden and Forgotten*), edited by Bobé and Dumreicher, constitutes a valuable help toward an understanding of former times.

NORWEGIAN. Drama. Collett Vogt's *Therese* is the story of a factory girl who marries her employer. It shows the influence of both Ibsen and Strindberg. Other plays deserving mention are Oskar Braaten's *Borgen* (*The Castle*), a three act comedy with very skillful character delineation, and Erling Moen's *Hermenn* (*Warriors*), written in Landsmaal (see **NEW INTERNATIONAL ENCYCLOPEDIA**, second edition, vol. xiii).

Fiction. Gunnar Gunnarson's *Den unge ørn* (*The Young Eagle*) is the fourth book treating the family history of the Borgs. It is not as strong a book as *Gæst den enøjede* (*One-Eyed Guest*), of which it is the sequel. In *Røising-folke* (*The People of Røising*), written in Landsmaal, Kristoffer Uppdal shows an intimate understanding of the people whose life he describes. A picture of the present submarine warfare is given in Øvre Richter Frich's *Kaperens klør* (*The Pirate's Claws*). Johan Vinsnes, whose last year's book *Et gatekryds* (*A Street Corner*) came out in a third edition, this year wrote *Broremand*, and Hans E. Kinck gave us *Mot karneval* (*Toward Carnival Time*).

Science, Literature, etc. Halvdan Koht's *Socialdemokratie* (*Social Democracy*), written in Koht's peculiar form of Landsmaal, is a review of the history of socialism. Johannes Steenstrup's *Historieskrivningen* (*The Writing of History*) discusses the development, characteristics, and aims of historiographical writing. The second volume of the *Edda*, which was launched last year (see 1914 **YEAR BOOK**) does not disappoint the hopes which it called forth.

SWEDISH. Drama. Mikael Lybeck's *Bror och syster* (*Brother and Sister*) is a tragedy of character. Feeling that his failure to care for his sister has driven the latter to steal, the brother assumes the guilt. Like so many plays since Ibsen, it resembles an epilogue of events preceding the play. The live characters in Hjalmar Berger's *Parisina* were well received at *Dramatiska Teatern*. Tor Hedberg, best known for his novels, this year gave us *Borga gård* (*The Borg Estate*).

Poetry. Swedish poetry has at present its strongest representatives in Finland. Among these Jacob Tegengren occupies no mean place. His work this year, *Ny vår* (*New Spring*), is dedicated to Nature, particularly spring. Arvid Mörner, another Finlander, wrote *Havets vår* (*The Spring of the Sea*), which has its main

strength in its lyric descriptions of Nature. Christian Günther's *Dikter (Poems)* is the most mature work of the author, who evinces particular skill in handling the sonnet and the old ballad. In Matt Magnus Granström's *Visor byn (Village Songs)* man's relation to nature is one of the chief motifs.

Fiction. An enthusiastic reception was accorded Selma Lagerlöf's *Kejsarn av Portugalien (The Emperor of Portugal)*, a psychologic-pathologic novel portraying a father's excessive love for his daughter. Else Kleen's *Släktens kvinnor (The Women of the Family)*, a work with a feminist tendency, pictures generations of women in their quiet submission to a race of overbearing tyrannical men. In his *Romantiska brev (Romantic Letters)*, Martin Koch shows a gain in firmness and clarity of style, but a loss in power of psychologic description. It is the story of an idealist, a believer in socialism and the workingman, who becomes disillusioned and loses his faith in both. Henning Berger's *Den andra sidan (The Other Side)*, though a creditable work, is below the author's regular standard. *Vårbrytning (The Advent of Spring)*, the first work of Karin Smirnoff, the daughter of Strindberg, describes a phase in a young woman's development. Among short stories, Anna Lenah Elgström's collection *Stjärnan vars namn är malört (The Star Whose Name is Worm Wood)* deserves particular mention. Instead of the realistic short stories for which this author is known, she now gives us a series of stories with romantic coloring, touching mainly woman's love. Erik Fahlman in his *Teckningar (Sketches)* gave us a number of fragments of stories, subjective sketches, etc. In Birger Mörner's *Från Arafias irrfärder (From Arafia's Wanderings)* the material from the Orient is treated with exceptional sympathy and understanding. Hanna Süderlund-Hammar made her debut with *Hård mark (Hard Soil)*, which takes its title from the rough and harsh exterior of the Swedish people portrayed in it.

Science, Literature, etc. Fredrik Böök's *Essayer och kritiker (Essays and Critiques)* evinces deep critical insight. Sven Hedin's *Från fronten i västern (From the Front in the West)* is an excellent description of events of the war.

Concerning SCANDINAVIAN LITERATURE, see also PHILOLOGY, MODERN.

SCANLAN, LAWRENCE, American Roman Catholic bishop, died May 10, 1915. He was born in County Tipperary, Ireland, in 1843, and graduated from All Hallows College, Dublin, in 1868. In the same year he was ordained a priest and for two years was assistant pastor of St. Patrick's Church, Dublin. He served as pastor of St. Mary's Cathedral in San Francisco for one year. He then filled several pastorates in California and Nevada, until in 1873 he was appointed pastor of Salt Lake City, and of the whole Territory of Utah. In 1887 he was consecrated bishop of Lerenda, *in partibus*, and Vicar Apostolic of Utah. He was appointed first bishop of Salt Lake City in 1897.

SCHECHTER, SOLOMON, American Hebrew scholar and educator, died Nov. 19, 1915. He was born at Fokshan, Rumania, on Dec. 7, 1847, and was educated in the universities of Vienna and Berlin. He graduated as a rabbi in Vienna in 1887, having made a specialty of divinity and Semitics. In 1890 he was elected lecturer in

the Talmud at Cambridge University, and in the next year received from that university the honorary degree of M.A. In 1892 he was elected reader of Rabbinic, and in the following year obtained the Worth studentship. He went to Italy, where he examined Hebrew manuscripts in all the important libraries. In 1894 he delivered a series of lectures in University Hall, London, which attracted the attention of Hebrew scholars all over the world. In 1896 he discovered the first leaf of the original Hebrew manuscript of *Ecclesiasticus*. A little later he went to Egypt and collected many fragments of other Hebrew manuscripts, which threw light on Jewish history from the ninth to the twelfth centuries. These were published in collaboration with Dr. Charles Taylor of St. John's College, Cambridge, and the collection was presented to the Cambridge University library. From 1899 until 1901 Dr. Schechter was professor of Hebrew at University College, London. He came to the United States in 1902, as president of the Jewish Theological Seminary, and remained in that position until his death. He received honorary degrees of Litt.D. from Cambridge in 1898 and Harvard in 1911. His published writings include: *Abot de Rabbi Nathan* (1887); *Studies in Judaism* (2 series, 1896-1908); *Wisdom of Ben Sira* (1899); *Midrash Ha-Gadol* (1902); *Saadyana* (1902); *Some Aspects of Rabbinic Theology* (1909); and *Documents of Jewish Sectaries* (2 vols., 1911).

SCHICK TEST. See DIPHTHERIA.

SCHINDLER, SOLOMON, American Jewish rabbi and writer, died May 5, 1915. He was born in Neisse, Germany, in 1842, and in 1862 graduated from the University of Breslau. He took postgraduate courses in German universities and in 1871 removed to the United States. He was minister to congregations in Hoboken and in Boston. In the latter city he was minister of congregation Adath Israel, from 1874-94. In the latter year he resigned the post as rabbi to become superintendent of the Jewish Federation of Charities of Boston. This position he held until 1899 when he became superintendent of the Leopold Morse Home. He retired from this position in 1909. From 1884 to 1894 he was a member of the Boston School Board. He was the author of *Messianic Expectations and Modern Judaism*; *Dissolving Views of the History of Judaism*; and *Young West*, a sequel to Bellamy's *Looking Backward*. He contributed many articles to periodicals.

SCHOOL ADMINISTRATION. See EDUCATION IN THE UNITED STATES.

SCHOOL BUILDINGS. See ARCHITECTURE.

SCHOOLS. For facts concerning elementary and secondary schools, see EDUCATION IN THE UNITED STATES; for professional and technical schools, see UNIVERSITIES AND COLLEGES AND AGRICULTURAL EDUCATION. For rural schools, see HYGIENE.

SCIENTIFIC CONGRESS, SECOND PAN-AMERICAN. See SOCIOLOGY.

SCOPOLAMIN-MORPHIN TREATMENT IN LABOR. See TWILIGHT SLEEP.

SCOTLAND. See GREAT BRITAIN.

SCHWARTZ, JOOST MARIUS WILLEM VAN DER POORTEN. See MAARTENS, MAARTEN.

SCULPTURE. See PAINTING AND SCULPTURE.

SEALS. See ALASKA, *Fur Seals*; FISH AND FISHERIES; and FUR.

SEALSKINS. See FUR.

SEAMAN, WILLIAM HENRY. American jurist, died March 8, 1915. He was born in New Berlin, Wis., in 1842, and was educated in the public schools. From 1859 to 1861 he worked as a printer. Enlisting in the First Wisconsin Infantry in 1861 he served until 1864. In 1868 he was admitted to the bar and was engaged in practice until 1883, and in 1905 he became circuit judge of the seventh circuit. From 1893 to 1898 he was president of the Wisconsin State Bar Association.

SEAMAN'S ACT. See LABOR.**SEAMEN'S LAW.** See SHIPPING.**SEAPLANE.** See AERONAUTICS.**SEARCHLIGHT.** See ELECTRIC LIGHTING.

SEDGWICK, ARTHUR GEORGE. American lawyer and writer, died July 14, 1915. He was born in New York City in 1844, and graduated from Harvard University in 1864. He served in the Civil War, and was taken prisoner. A confinement in Libby Prison resulted in an illness, which disabled him from further service. He returned to Boston, and practiced law until 1872. With O. W. Holmes, Jr., he edited the *American Law Review*. In 1875 he removed to New York City, where he was engaged in the practice of law until 1881. He joined the staff of the *New York Evening Post*, and the *Nation*, and continued an active contributor to those publications until 1905. In 1885 he was lecturer of law before the Lowell Institute of Boston, and in 1909 he was Godkin lecturer at Harvard. He was the author of *Treatise on the Principle and Practice Governing the Trial of Title to Land* (with F. S. Wait); of *Elements of Damages*; the editor of several editions of his father's book, *Measure of Damages*; and also one of the authors of the *Essays on the Nineteenth Century*.

SEDIMENTATION. See GEOLOGY.**SEISMOLOGY.** See EARTHQUAKES.

SELANGOR. A state on the western coast of the Malay Peninsula; one of the Federated Malay States (q.v.). It has a coast line of about 125 miles. Kuala Lumpur (46,718 inhabitants in 1911) is the capital of the state and the administrative headquarters for the federation. The chief port is Port Swettenham. Import duties are levied on opium, spirits, beer, and petroleum. Tin mining is the main industry, the exports in 1913 being 258,825 piculs, valued at 26,692,609 Straits Settlements dollars. Area actually under rubber in 1913, 208,714 acres; alienated for rubber cultivation, 313,142 acres. The value of the tin export (1909) was 18,088,479 Straits Settlements dollars. Area alienated for mining, 68,918 acres; Chinese miners employed, 73,885. A native Sultan is administrator, advised by a British resident.

SELENIUM. See PHYSICS.

SENEGAL. One of the constituent colonies of the government-general of French West Africa. The capital is Saint-Louis. The estimated area is 191,640 square kilometers (73,992 square miles). The population was recently reported at 1,247,979, consisting of 4229 French, 646 foreigners, 1,239,503 natives (French subjects), and 3601 natives (not French subjects). The natives (French subjects) included 888,467 Mohammedans, 346,336 fetishists, and 4500 Roman Catholics. The principal races are: the Wolof (Mohammedan), about 466,000; the Serer (fet-

ishist), 183,000; the Peulh (mostly Mohammedan), 168,000; the Toucouleur (Mohammedan), 139,000. There are considerable numbers also of Diola, Mandingo, Bambara, and Fulah. Principal towns: Dakar, the capital of French West Africa, with 25,630 inhabitants (of whom 2397 French); Saint-Louis, 22,276 (896); Rufisque, 12,490 (311); Tivavouane, 3443 (96); Thiès, 2397 (129).

In recent years, agriculture has developed notably. By far the most important crop commercially is peanuts, which constitute the chief export. Other crops are millet, corn, and manioc. There is some production of gum, rubber, wax, and palm kernels. Grazing is practiced, especially among the Peulh, Toucouleur, and Serer. In 1912, imports and exports of merchandise were valued at 67,859,907 and 56,019,804 francs respectively. The chief exports were: peanuts, 41,161,966; gums, 2,315,494; rubber, 1,077,011; palm kernels, 705,514; cattle, 263,500 (2108 head). Of the total trade 54.64 per cent was with France.

From mid-July to early October the Senegal River is navigable to Kayes (in the colony of Upper Senegal and Niger). Dakar has rail connection with Saint-Louis, 264 kilometers (170 miles). From Thiès, 91 kilometers from Dakar, a line starts for Kayes; it has been completed as far as Koulougadougou, 348 kilometers (216 miles).

SERBIA. A kingdom of eastern Europe, divided from Hungary by the Danube and the Save, and bordered by Bulgaria on the east, by Albania and Montenegro on the west, and by Greece on the south; one of the Balkan States. Belgrade (Biograd, the "white fortress") is the capital.

AREA AND POPULATION. The table below shows area by departments, population according to the census of Dec. 31, 1910, population as calculated Dec. 31, 1911, and density (1911) per square kilometer:

Department	Sq. kms.	1910	1911	D.
Belgrade *	12	89,876	92,288	128
Belgrade	2,025	155,815	158,878	...
Kragujevats	2,295	189,025	192,124	84
Krajina	2,909	112,142	118,128	39
Krushevska	2,710	167,371	170,353	63
Morava	2,900	203,638	206,547	71
Nish	2,558	198,768	201,762	79
Uzhitsa	3,288	146,763	149,112	45
Pirot	2,419	112,814	114,115	47
Podrinje	3,851	238,275	242,029	68
Pozharevats	4,157	259,906	262,208	63
Rudnik	1,569	85,340	87,137	56
Smederivo	1,277	143,216	144,829	119
Chechak	3,798	138,911	141,267	37
Timok	3,196	149,538	150,965	47
Toplitsa	2,889	110,218	112,610	40
Valjevo	2,459	157,648	160,878	65
Vranja	4,342	252,987	257,087	59
	48,803†	2,911,701	2,957,207	61

* City. † 18,650 square miles.

According to religions the censused population was divided into Greek Catholics, 2,881,220; Roman Catholics, 8435; Mohammedans, 14,335; Jews, 5997; Protestants, 799; and other religions, 915. The marriages in 1912 numbered 13,289 (30,453 in 1911); births, 114,257 (107,229); deaths, 63,358 (64,415). Belgrade had (1911) 90,890 inhabitants; Nish, 24,949; Kragujevats, 18,452; Lescovats, 14,266; Pozharevats, 13,411; Vranja, 11,439; Pirot, 10,737. Bitolj (Monastir) had in 1910 a population of 59,856;

Skoplje (Usküb), 47,384; Prilip (Perlepe), 21,783; Prizren, 21,244; Prishtina, 18,174.

By the terms of the treaty of Bucharest (July 25, 1913), Serbia gained, as the result of the wars in the Balkans, the eastern part of Novibazar, Kossovo, and Central Macedonia. The new territories have an area estimated at 39,000 square kilometers, and are composed of the following territories: Bitolj, with 345,759 inhabitants; Ishtib, unknown; Debar, 82,476; Kavadar, 97,763; Kumanovo, 166,939; Novibazar, 133,401; Plevlje, 62,601; Prishtina, 239,386; Prizren, 227,425; Skoplje (Usküb), 153,293; Tetovo, 157,249.

Primary instruction, nominally compulsory; actual attendance, less than 25 per cent. More than 80 per cent of the adult population, illiterate. On the other hand, with nearly every peasant occupying and cultivating his own freehold, varying from 10 to 30 acres, there was practically no pauper population.

PRODUCTION. The most fertile and densely populated among the Balkan States, Serbia is essentially an agricultural country, and stock raising has been the most important occupation of the people. Tilled fields alternate with oak-covered hills which maintain great herds of swine. Of the total area (1904), 1,865,392 hectares were under cultivation, and 1,546,000 under forests. Cereals, plums in large quantities, and vines were grown. No returns for area and production of main crops have been available since the wars in the Balkans. There were 965,208 cattle in the country, Dec. 31, 1910, 3,808,815 sheep, 152,617 horses, 836,544 swine, and 627,427 goats. The mineral resources include coal and lignite, copper ore, and gold. The manufactures include milling, brewing, distilling, sugar refining, carpet weaving, and meat packing. In the year 1915 there were no reports to be made upon peaceful industries, no returns of tilled fields yielding their golden harvest; there remains only the record of a famished and homeless people, of valiant armies gone out desperately and nobly to annihilation, of field and forest and hamlet and town laid waste and desolate by the invading hordes of the Central Powers.

COMMERCE AND COMMUNICATIONS. Trade, formerly largely with Austria-Hungary, is at a standstill. Totals for 1912 give 106,093,000 dinars imports and 84,221,000 exports (wheat 17,771,000; meats, 15,280,000; corn, 7,396,000; hides, 7,332,000; poultry, 3,751,000; live animals, 2,130,000; prunes, 1,764,000; etc.). Imports for consumption and exports of domestic produce for 1911 are given below, with totals for 1910 and 1909, values in thousands of dinars (1 dinar = 19.3 cents):

	<i>Imps.</i>	<i>Exps.</i>		<i>Imps.</i>	<i>Exps.</i>
Foodstuffs, etc. . . .	22,769	103,776	Stone, etc. . .	1,619	182
Metals . . .	20,304	9,657	Glass	1,520	..
Minerals . .	6,986	718	Machinery . .	12,350	28
Drugs	7,573	288	Other	..	..
Textiles, etc. . .	31,416	2,148	mdse.	1,041	43
Hides, etc. .	4,575	87	T'l. '11. 115,425	116,916	
Luxuries. . .	2,809	66	T'l. '10. 84,697	98,888	
Paper	2,513	28	T'l. '09. 75,585	92,982	

Countries of origin and destination follow in the 1912 trade with values in thousands of dinars:

	<i>Imps.</i>	<i>Exps.</i>		<i>Imps.</i>	<i>Exps.</i>
Aus.-H. . . .	32,659	36,076	Belgium . . .	914	7,178
Germany . . .	31,117	18,279	Rumania . . .	2,172	5,777
U. K.	8,511	2	Bulgaria . . .	779	1,590
France	3,713	2,978	Other	19,763	1,366
Italy	3,631	3,785			
Turkey	2,784	7,190	Total	106,093	84,221

Railways have never been efficient for the proper development of the country. At the end of 1913 there were in operation 555 kilometers of standard and 414 of narrow gauge railway: in the acquired territory, 387 kilometers of standard gauge, 111 local line, and 105 industrial line. There were under construction 344 kilometers. Telegraph lines in 1912, 4403 kilometers, with 8355 kilometers of wires; State telegraph stations, 211; post offices, 1556. The Danube, the Save, and the Drina are the navigable rivers. The roads are badly in need of repair, many being nearly impassable.

FINANCE. The budget for 1914 was reported to balance at 214,321,000 dinars. Revenue from direct taxes, 57,347,000 dinars; monopolies, 53,743,000; state railways, 25,330,000; customs, 15,011,000; etc. Expenditure by the ministry for war, 54,321,000; finance, 25,768,000; public works, 34,710,000; worship and instruction, 14,504,000; pensions and subventions, 9,918,000; justice, 4,053,000; interior, 7,658,000; agriculture and commerce, 7,648,000; debt charge, 45,975,000; etc. The public debt stood, Jan. 1, 1913, at 654,050,500 dinars.

GOVERNMENT. The executive authority is vested in a King assisted by a cabinet of eight responsible heads of departments. After the murder of Alexander I (Obrenovitch), May 29, 1903 (o. s.), Peter Karageorgevitch, grandson of the celebrated Kara George, and son of Alexander Karageorgevitch, was elected King (June 2, 1903 o. s.) under the name Peter I. He was born June 29, 1844 (o. s.), married (1883) Princess Zorka of Montenegro, and has two sons: George (born 1887), who was forced in 1909 to renounce his right of succession on account of incompetence and violence, and Alexander (born 1888), the heir-apparent.

The Narodna-Skupshtina (160 members) is the legislative body. Previous to 1878 Serbia was an autonomous Turkish dependency; in November, 1912, she recaptured from Turkey her old capital, Usküb.

HISTORY. The campaign of December, 1914, cleared Serbia's soil of invading armies (see the YEAR BOOK for 1914, article on WAR OF THE NATIONS), but left the nation exhausted, without the means to care for the thousands of wounded soldiers, and without even sufficient food for the civilian population. Peasants had deserted their farms in panic before the approach of the Austrian troops, and were now left destitute in the towns. Typhus and other dread diseases played havoc among civilians and soldiers alike. Again and again Serbia sent out desperate pleas for assistance in her misery. As in the case of Belgium, the response was most generous. Subscription lists were started in England, France, and America for the Serbian Relief Fund; provisions and medical supplies were freely contributed; doctors, nurses, and sanitary experts rendered heroic voluntary service in the plague-ridden country; the starving peasants were taken back to their farms and supplied with seed to plant their fields. A corps of

Columbia University students, equipped with motor trucks, rendered notable service in taking the starving peasants back to their deserted farms and supplying them with seed to plant their desolate fields. Meanwhile there was little activity of moment along the Austro-Hungarian frontier, only occasional skirmishes between outposts. Serbian relations with Bulgaria were embittered by Serbia's reluctance to accede to Bulgaria's demands for the cession of Serbian Macedonia as a preliminary step toward the reconstitution of the Balkan alliance. While Bulgaria claimed that the inhabitants of the Macedonian territory annexed by Serbia in 1913 were largely Bulgar in race and sympathy, Serbia persisted in regarding her new subjects as loyal Serbian citizens. In an order of the day published Dec. 30, 1914, Prince Alexander of Serbia promised that "our brothers whom we have delivered from the Turks," having shown their patriotism by fighting in the Serbian armies against Austria-Hungary, "will enjoy the political and constitutional rights which Serbia the liberator enjoys. In its first sitting after the conclusion of peace, the Skupshtina will take all the necessary measures to put this decision into effect." From Bulgarian sources, however, came frequent reports of unrest in Serbian Macedonia, due, said the Bulgarians, to the harsh methods which the Serbian authorities were employing to stamp out all traces of Turkish and Bulgar nationality in that region. The Valandova Incident (consult the article on BULGARIA, *History*), which the Serbian government regarded as a Bulgarian raid into Serbian territory, was represented by the Bulgarian government as an insurrection of discontented inhabitants of Serbian Macedonia. Notwithstanding the irritation caused by the Valandova affair, negotiations continued in respect of the new Balkan alliance which the Entente diplomats had so much at heart. The Skupshtina had no sooner been convened, August 16th, than a secret session was ordered for the consideration of the proposals which the Quadruple Entente had secretly made to Serbia regarding the relations of the Balkan State. Although neither the text of the Entente's advices, nor the results of the Skupshtina's deliberations, were made public, it was generally believed that the Entente advised compliance, and that the Skupshtina authorized partial compliance with Bulgaria's demands. The Skupshtina signified its complete confidence in the cabinet by an overwhelming vote, and authorized a new war credit of \$50,000,000. In October Austro-German forces again invaded Serbia; Bulgaria declared war on Serbia, October 14th; and the Serbian armies were swept from the field before the close of November. A few thousand Serbian soldiers, and throngs of frightened civilians, fled across the frontier into Albania or Montenegro; a small Serbian army in the extreme south attempted in vain to cooperate with the Anglo-French force which early in December advanced against the Bulgarian forces in Serbian Macedonia; by December 14th Serbia was completely in the hands of the victorious Bulgars and Teutons. King Peter and the officials of the Serbian government escaped into Montenegro, and Italian dispatches asserted that the seat of the Serbian government would be removed to Italy.

SERUMS. See CHOLERA.

SERUM THERAPY. There is a growing

tendency to use the patient's own blood or serum in the treatment of a number of diseases, rather than the injection of foreign serum. The process is known as autohemotherapy, or auto-serotherapy. Spiethoff reinjected the patient's own blood or serum in various skin affections, especially in eczema, in which disease he inserts a canula into a vein, withdraws from 100 or 200 c.c. of blood and immediately reinjects it into the tissue. The procedure may be repeated daily or for weeks. Ramond and Goubert used a similar technic in 50 cases of typhoid fever. Their results were very favorable in 38 per cent of the cases, and negative in 44 per cent. Netter adds new testimony to the value of serotherapy in cerebrospinal meningitis. Of 226 cases treated since 1907 the mortality was only 12.5 per cent, in cases of pure meningococcus infection; whereas before the introduction of the serum treatment it varied from 48.5 per cent to 83.3 per cent. Netter says that the efficacy of the serum is evident not only in the mortality reduction, but in rapid recovery and rarity of complications.

SERVIA. See SERBIA. The form *Servia* has been generally adopted at the request of the Serbian government.

SETTLEMENTS AND SETTLEMENT WORK. See CHARITIES.

SEVENTH DAY ADVENTISTS. See ADVENTISTS.

SEVENTH DAY GERMAN BRETHREN. See BRETHREN, CHURCH OF THE.

SEWAGE PURIFICATION. Some progress was made with fine screening, many Imhoff tanks were completed or put under way, and much attention was paid to the possibilities of a new form of aeration, known as the activated-sludge process. If the latter proves to be as successful as some who are studying it think it will be then a new era in sewage treatment will arrive. Before going further the present status of sewage treatment may well be outlined, with particular relation to the degree of treatment required to meet various local conditions. A small amount of the coarser suspended solids is often removed by coarse screens, generally in the form of inclined bars of iron or steel placed in a channel through which the sewage is passed. Finer screens, of wire mesh or perforated sheet metal, are used, either alone or in conjunction with coarse screens, to remove a larger amount of solid matter than the coarse screens will intercept. During the year a few units of a German type of fine screens known as the Reinsch-Wurl were put under construction in the United States, notably at Brooklyn, New York City, and Cleveland, Ohio. In these screens the liquid passes through perforated metal plates. Some of the solids are retained by the plates, which are inclined revolving disks, with a portion of their area protruding above the surface of the sewage. From this protruding portion revolving brushes sweep the retained solids from the disk. Where it is desired to remove all the settleable solids from sewage sedimentation tanks are employed. If in addition to removing the solids by settlement it is considered advisable to reduce the volume of the sediment or sludge, the tanks are so designed as to retain the sludge, letting the more or less clarified liquid pass on. The retained sludge is digested through the action of anaerobic bacteria; gases and water are given off, and a residue produced which resembles garden

mold. These are known as septic tanks. A later or improved type was called the Travis or hydrolytic tank and an improvement on this is known as the Imhoff or Emscher tank. Both Travis and Imhoff tanks are often called two-story septic or settling tanks, because the sludge passes from an upper or settling chamber down a sharply sloping V-shaped bottom and through slots into a digesting chamber. Since some of the settleable solids are inorganic, as sand from street surfaces, and cannot be digested, it is frequently found advantageous to remove them in small settling tanks called grit chambers, before the sewage goes to the septic tank. Either screened or settled sewage still contains very finely divided organic matter in suspension, and also organic matter in solution. This organic matter is liable to offensive decomposition unless brought into contact with a sufficient volume of oxygen to effect more or less complete nitrification. If a sufficiently large volume of natural water can be reached by an outfall sewer, the free oxygen in the water affords the simplest of means of oxidizing or nitrifying the organic content of the sewage and rendering it non-putrefactive. Otherwise, oxidation may be had by applying the sewage to intermittent sand filters, percolating or sprinkling filters, or contact beds. Where a very high degree of treatment is necessary two filter beds may be used in succession, as double contact beds or percolating filters followed by sand filters. Percolating-filter effluents are sometimes passed to secondary settling tanks and may even go to sand beds after that. Where a reduction or virtual elimination of the bacterial content of sewage is deemed necessary reliance cannot be placed in any of the processes named or in all of them combined—except intermittent sand filters, operated at a low rate. Even then, for economy and efficiency, it is necessary to give the sewage a preliminary treatment by one or more of the methods described. The most certain method of bacterial removal is disinfection by hypochlorite of calcium or lime, hypochlorite of sodium, or chlorine gas, the latter as evolved on liberating liquid chlorine stored in pressure cylinders. Any one of these disinfecting agents may be employed. Until recently one of the hypochlorites (generally calcium) was used, but liquid chlorine is rapidly growing in favor because of its greater convenience, and also because its price has not been increased nearly so much by the European war as has that of hypochlorite. Thus far disinfection has not been much used, except at relatively small sewage-treatment plants. To obtain high efficiency with certainty it is generally necessary to remove a large percentage of the organic matter before applying the disinfectant, else a large part of the agent will be used in oxidizing the organic matter.

In new sewage-treatment works to-day the most common practice is to use coarse or fine screens where the removal of only a small percentage of solid matter is demanded; plain sedimentation or else two-story or Imhoff tanks if it is essential to remove all or nearly all the settleable solids; sprinkling filters if a non-putrefactive effluent is called for; intermittent sand filters (where suitable sand can be found) for a still higher degree of oxidation or for bacterial removal; and disinfection as a finishing disinfecting process. Various combinations of these methods may be used to meet local sani-

tary and economic conditions. The foregoing review has made clear, it is hoped, that there are many methods or combinations of methods of sewage treatment rather than one single and best method, and that a choice depends upon the degree of treatment required and upon the capital and operating costs as affected by local considerations.

The largest installation of Imhoff tanks yet built in America was completed at Baltimore, Md., during 1915, and some of them were put in use. Nearly 250 Imhoff tanks had been built or put under construction in Germany and the United States by the close of 1915, of which about 70 were in the United States. See "Eight Years' Design and Operation of Imhoff Tanks," by Dr. Karl Imhoff (*Engineering News*, Jan. 6 and 13, 1916).

ACTIVATED SLUDGE. Ever since it was understood that oxidation is nature's favorite way of transforming the organic matter in sewage from an unstable putrefiable condition to a stable, inoffensive, and non-putrefactive state, attempts at forced aëration have been pursued with an ardor that has been only temporarily quenched by repeated failure to find a method that would give the desired results at reasonable cost. The various types of filters are all oxidation beds, but the air is introduced by natural means. Forced aëration of oxidation or bacteria beds has been tried but has not yet been in use on a working scale. Direct aëration of sewage in tanks has also been tried, but until recently it has seemed to be impracticable. In 1913, after observing some experiments with forced aëration of sewage in bottles at the Lawrence Experiment Station of the Massachusetts State Board of Health, Dr. Gilbert J. Fowler, a well known English chemist and sewage-works expert, went back to Manchester, England, and began a new line of experiments. He aërated sewage in a receptacle, removing some of the liquid from time to time, but retaining the sludge until he had accumulated a considerable quantity and this had become laden with and "activated" by oxidizing bacteria. The process of aëration was then continued, both liquid and sludge being removed from the receptacle from time to time. His experiments at Manchester were repeated elsewhere in England. Knowledge of them reached the United States. In the latter part of 1914, and the first half of 1915, a similar line of experiments was taken up at some 10 places in the United States and one or two in Canada, Dr. Fowler himself being retained as consultant by the city of Milwaukee, where the experiments have been conducted on a more varied and, in part, on a larger scale than anywhere else. The State Water Survey of Illinois, acting with the University of Illinois at Urbana, went deeply into a study of the new process. The United States Public Health Service took it up, both in its laboratory at Washington and in coöperation with the city of Baltimore. At the latter place an Imhoff tank was modified for use as an activated-sludge tank. Other places where the process was being studied in 1915 were Chicago, by the Sanitary District and by the packing houses; Cleveland, Ohio; the Lawrence Experiment Station; Brockton, Mass.; Brooklyn, N. Y.; Houston, Texas; and Regina, Saskatchewan, Canada. Milwaukee and Cleveland let contracts for working units of a capacity of about 2,000,000 gallons a day, and a plant for Hous-

ton was under consideration. The war put a damper on the activated-sludge process in England, but plans for several working-scale installations have been made. What is this new process? It consists of blowing air under low pressure up through the bottom of a tank containing sewage and an accumulation of sludge about 25 per cent in volume of the holding capacity of the tank. The air is distributed through porous blocks or plates (diffusers), located in the bottom of the tank. As the air rises it forces the accumulated sludge, actuated by myriads of bacteria, up through the sewage, keeping it in suspension so the particles of sewage are brought in contact with the particles of bacteria-laden sludge. A portion of the treated supernatant liquid is removed—either from time to time or all the while, according as the tank is operated on the fill-and-draw or on the continuous plan. The suspended matter in the removed liquid settles with surprising rapidity, leaving a remarkably clear sewage effluent. Under the best conditions, the nitrification of organic matter, and also the removal of bacteria, is high. Both analyses of the activated sludge and careful observations of its effects on plant growth have been made at the University of Illinois with highly promising results. The packing house industries at Chicago are said to be much interested in the process as of possible application to their great waste-disposal problem. The economic practicability of the process is not yet fully determined. It is known that it effects a high degree of purification, and can readily be adapted to almost any range of purification, but the cost of operation and the effect of very cold weather, as well as a number of other questions, have yet to be settled. Several British and one American patent on the process have been taken out. The American patent has been dedicated to the public. See *Engineering News*, April 1, July 15, 22, and 29, and Dec. 9, 1915. For a new and comprehensive book on sewage treatment see Metcalf and Eddy, *American Sewage Practice*, vol. iii., *Sewage Disposal* (New York).

SEWERAGE. Modern ideas of convenience and sanitation demand running water in every city or village house, and the quick removal of the used and soiled water from both the house and the city. Many cities of considerable size are still largely without sewerage systems, and a few very backward ones have no sewers at all. As a rule, however, even our smaller cities have made at least a beginning of a sanitary sewerage system, using small sewers for the removal of house and industrial wastes only, and postponing the construction of storm sewers for carrying off the rain water that accumulates on the street surfaces. Vitrified clay pipe, commonly known as sewer pipe, is still the material almost universally used for small sewers, but for large sewers brick and stone are rapidly giving way to reinforced concrete or to terracotta. The reinforced concrete is more generally in the form of separately molded sections of pipe, provided with hub-and-socket joints; but frequently segmental blocks, molded to the size and form of the sewer, are employed. Segmental blocks of terracotta are also used. During 1915 the second and third volumes of Metcalf and Eddy's *American Sewerage Practice* (New York) were published. The three volumes are as follows: I. *Design of Sewers*. II. *Construction of Sewers*. III. *Disposal*

of Sewage. See also the article SEWAGE PURIFICATION.

SEX DETERMINATION. See ZOOLOGY, *Sex Determination*.

SEX HYGIENE. See HYGIENE.

SHARP, BENJAMIN. American zoölogist and explorer, died Jan. 24, 1915. He was born in Germantown, Philadelphia, in 1858, and was educated at Swarthmore College. He studied medicine at the University of Pennsylvania, receiving his degree in 1879. He took postgraduate courses in Germany and Italy. In 1883 he was appointed professor of invertebrate zoölogy in the University of Pennsylvania, holding this chair for two years. From 1890 to 1901 he was life member and corresponding secretary of the Academy of Natural Sciences of Philadelphia, for which he made expeditions in the Caribbee Islands in the winter of 1888-89. He also conducted exploration parties to the Hawaiian Islands, the Arctic region, Alaska, and Siberia. He was zoölogist in the first Arctic expedition of Admiral Peary in 1891. He was a member of many scientific societies and contributed to magazines on the subjects of his expeditions and on fishing, and history. He was also well known as a lecturer. From 1910-15 he was a member of the General Assembly of Massachusetts.

SHATTUCK, SAMUEL WALKER. American educator, died February, 1915. He was born in Groton, Mass., in 1841, and graduated from Norwich University in 1860. He took postgraduate studies in civil engineering, receiving his degree in 1871. From 1861 to 1865 he served in the Civil War, rising to the rank of captain. In the latter year he was appointed adjunct professor of mathematics and military tactics in Norwich University. He was appointed adjunct professor and president pro tempore of Norwich University. In 1868 he became assistant professor of mathematics and instructor in military tactics at the University of Illinois. He was a member of the faculty of this university as professor of civil engineering, head of the department of mathematics, and professor of mathematics until 1912, when he was made professor emeritus. From 1905 to 1912 he was controller of the university. He was a member of many learned and patriotic societies.

SHAW, DR. ANNA HOWARD. See LITERATURE, ENGLISH AND AMERICAN, *History*.

SHAW, GEORGE BERNARD. See DRAMA, AMERICAN AND ENGLISH.

SHEEP. See STOCK RAISING AND MEAT PRODUCTION.

SHERMAN, FRANK ASBURY. American scholar and educator, died Feb. 26, 1915. He was born at Knox, Me., in 1845, and graduated from Dartmouth College in 1870. He served in the Civil War from 1862 to 1865. He was several times wounded and lost his left arm in the battle of the Wilderness. In 1870-71 he was instructor in mathematics at the Worcester Polytechnic Institute, and the latter year was appointed professor of mathematics at Dartmouth College and continued to hold this position until 1911, when he became professor emeritus.

SHIPBUILDING. Shipbuilding statistics for 1915, so far as Europe was concerned, were at best fragmentary and unsatisfactory. The returns for the United Kingdom included absolutely no warship work, but for the other countries referred to in the following list from the *Glasgow Herald* there is included all warship

work reports of which have been received. The purely British production, notwithstanding the war, was enormously larger than that of any other country, and were the warships and other government vessels building included, naturally the totals would be increased. The Clyde alone had a production almost equal to that of Holland.

Summary of the world's shipbuilding for 1915:

	Vessels	Tons	I.H.P.
United Kingdom	517	649,336	540,594
United States	127	270,124	822,168
Holland	390	217,592	114,510
The Clyde	126	215,060	180,503
Germany	46	179,804	188,156
The Tyne	35	124,299	92,420
The Tees	40	111,293	91,980
The Wear	31	111,225	70,619
Japan	127	98,213	182,039

The accompanying table, also from the Annual Shipbuilding Review of the Glasgow *Herald*, summarizes the shipbuilding returns of non-British yards for 1915, as compared with the previous year:

	1915		
	Vessels	Tons	I.H.P.
United States	127	270,124	822,168
Holland	390	217,592	114,510
Germany	46	179,804	188,156
Japan	127	98,213	182,039
Norway	86	61,477	41,925
Denmark	40	51,361	32,042
France	32	41,438	20,950
Sweden	33	25,927	32,530
Italy	4	20,230	20,000
Spain	7	14,306	13,750
China	50	8,073	6,400
Russia	13	792	540
Total	955	989,837	975,010

	1914		
	Vessels	Tons	I.H.P.
United States	156	270,962	806,465
Holland	674	279,684	116,618
Germany	184	505,719	572,653
Japan	164	136,309	125,614
Norway	67	54,108	39,555
Denmark	39	33,463	19,551
France	98	196,540	203,630
Sweden	29	14,657	13,760
Italy	54	41,792	35,455
Spain	9	21,197	33,000
China	68	16,664	12,120
Russia	14	33,976	61,000
Austria	28	78,457	58,800
Belgium	16	10,595	.....
Total	1,600	1,694,028	1,597,721

The condition of the shipbuilding industry in 1915 throughout the world was reflected in the small number of large vessels launched. Where in 1914 the colossal German liner *Bismarck*, of 56,000 tons, had been put into the water at Hamburg, and the second largest, the White Star liner *Britannic*, of 50,000 tons, had been launched at Belfast, in 1915 there were launched only nine vessels of 10,000 tons measurement or more, and of these, three were built in Great Britain, five in Germany, and one in the United States. They were as follows:

Vessel, Type and Builders	Tons
Aotearoa (geared turbine), The Fairfield Co....	15,000
Ausonia (twin-screw turbine), Blohm & Voss...	14,000
Aurania (geared turbine), Swan, Hunter, etc...	13,400
Weisenfels (cargo str.), The Weser Co.....	12,000
Altensfels (cargo str.), J. C. Tecklenborg.....	11,000
Aschenburg (cargo str.), J. C. Tecklenborg....	11,000

Vessel, Type and Builders	Tons
Meiningen (passenger str.), J. C. Tecklenborg...	11,000
Achilles (steam collier), The Maryland Co.....	10,650
San Gennaro (T. s. str.), Palmers Co.....	10,300

In Great Britain shipbuilding in 1915 was in very much the same position as the iron and steel industries, and the various yards were correspondingly organized and used to the best advantage of the Empire. The various private works were linked together so as to coöperate in the interests of the navy and the transport service, and in at least four important yards, namely, Brown's on the Clyde, Armstrong on the Tyne, Vicker's at Barrow, and Cammell's at Birkenhead, the building of merchant ships was suspended, except for such vessels as could be transferred into serviceable craft for naval use. At the end of the year there was naturally no information forthcoming as to the ships that had been transferred to the Admiralty or the warships that were building. The effect of the war was to hold up on the Clyde the construction of some large liners, but a few vessels of considerable tonnage, including the *Aotearoa*, a geared turbine vessel for the Union Steamship Company of New Zealand built in the Fairfield yard, were launched during the year. It was also reported that at the end of the year there were a fair number of vessels on the stocks. The Tyne, where a large number of tramp steamers ordinarily are constructed, was also engaged in naval work, so that its yards were unable to take up the construction of many merchant vessels that owners would have been only too glad to put under way. At Belfast, Harland and Wolff launched no merchant steamers during the 12 months, but they completed the *Britannic*, which became the largest ship afloat, it being about 50,000 tons displacement, 900 feet in length, with an extreme breadth of about 94 feet, as compared with the *Aquitania*, which has a length of 865 feet and breadth of 97 feet. It was reported at the end of 1915 that the British government had given permission in certain cases for merchant vessels in course of building to be completed.

The decrease in British output was most marked in Scotland, especially on the Clyde, the accompanying summaries showing the comparative figures for 1915 and 1914:

	1915		
	Vessels	Tons	I.H.P.
Clyde	126	215,060	180,503
Forth	21	5,427	6,285
Tay	10	4,895	4,180
Dee, etc.	50	8,119	14,840
Total	207	238,501	205,288

	1914		
	Vessels	Tons	I.H.P.
Clyde	307	460,253	496,120
Forth	18	19,733	9,440
Tay	18	13,335	10,200
Dee, etc.	111	15,619	24,530
Total	454	508,945	540,290

A similar decrease was to be observed in the output of English yards where the production of mercantile vessels fell from 967,000 to 384,000 tons and the indicated horse power from 639,000 to 310,000. The accompanying table shows the English mercantile tonnage for the last two years:

	1915		
	Vessels	Tons	I.H.P.
Tyne	85	124,299	92,420
Tees	40	111,293	91,980
Wear	81	111,225	70,619
Humber	79	26,098	45,105
Mersey	52	6,857	8,780
Thames	34	2,807	4,770
Bristol Channel	2	1,160	270
English Channel	25	688	1,630
Total	298	384,417	810,574

	1914		
	Vessels	Tons	I.H.P.
Tyne	91	315,896	196,465
Tees	99	250,638	165,400
Wear	74	278,537	148,365
Humber	117	55,574	60,601
Mersey	165	45,076	37,777
Thames	179	11,768	18,095
Bristol Channel	20	3,867	195
English Channel	72	5,983	12,756
Total	817	966,839	639,654

A revival of shipbuilding took place in the United States during the year 1915, and from July to December there was a large and especially notable increase in addition to the construction during the government's fiscal year ending June 30th, and summarized in the commissioner of navigation's statistics (see SHIPPING). On July 1, 1915, 46 vessels of a net tonnage of 282,718 tons were building or under contract in American yards, and within six months further orders were given for 52 vessels, with a gross tonnage of 323,602 tons. Of this amount over 57 per cent were designed for bulk oil carriers, 27 per cent for general freight carriers, about 8 per cent for colliers, and the remainder for passenger and freight ships. From July 1st 187 vessels, of 53,829 net tons were added to the American registry. The gross additions were 459 vessels with net tonnage of 144,736. From these deductions had to be made for vessels lost, abandoned, or sold to aliens amounting to 272 with a net tonnage of 90,907 tons. The American registry is shown to have covered on December 1st 26,888 vessels with 8,443,258 net tons. In American yards there were building in December not only ships for American owners but four vessels of 3500 tons each for Norwegian owners, and two others of 5000 tons each for other foreign owners, a total of 24,000 tons for foreign capital.

The year 1915 in American shipbuilding was, as a whole, one of unparalleled activity, and at the end of the year it was reported that there were over 200 large merchant vessels totaling 700,000 gross tons under construction. In private ship yards there were in addition about 59 government vessels aggregating 168,152 tons displacement under way, while at the government navy yards 12 vessels aggregating 176,010 tons displacement, were building, making a total of 71 government vessels, of 344,162 tons displacement. These statistics did not include the tonnage of 40 submarines, 11 of which were building for foreign navies, as the particulars of American submarines under construction were not being disclosed. The various merchant vessels being constructed were classed as follows: 116 of 643,475 gross tons, were large sea-going vessels, for the most part over 3000 tons; 13 of these were over 10,000 tons each; 26 ranged from 7000 to 10,000 gross tons; 27 from 5000 to 7000 gross tons; 10 from 4000 to 5000 gross tons;

and 42 from 2000 to 4000 gross tons. As regards their application, they were grouped as follows: 48 oil tankers, of 343,851 gross tons; 53 freighters, of 228,041 gross tons; 9 colliers, of 39,835 gross tons; 6 passenger and freight steamers, of 31,728 gross tons.

The aggregate tonnage of large sea-going merchant vessels built in the United States was less than for several years. Considering the type of vessels over 100 gross tons, there were completed during the year 129 sea-going merchant vessels aggregating about 173,223 gross tons, in addition to 18 government vessels aggregating 48,146 tons displacement. Two of the sea-going merchant vessels in the above group were over 10,000 tons; 4 between 7000 and 10,000; 10 between 5000 and 7000; 2 between 4000 and 5000; 6 between 3000 and 4000. Of these, 19, aggregating 62,039 gross tons, were freighters; 6, of 38,400 gross tons, colliers; 5, of 33,238 gross tons, oil tankers; 10 passenger and cargo steamers, of 15,014 gross tons; and 9 oil barges, of 3963 gross tons.

These statistics for work actually completed indicate commercial and shipping conditions of an earlier year, as few contracts for merchant vessels were made in 1914, with the result that the deliveries in the following year were exceedingly small. Regarding the work put under way in 1915, first in importance, as well as in point of time, were the large oil tankers, and these were soon followed by large freight carrying steamships. All of the large ship owners desired export vessels as soon as possible, and soon the capacity of the yards was so taxed that it was impossible to place contracts for large merchant vessels on the sea coast for delivery within two years. The greatest output of merchant vessels in 1915 was from the yard of the Maryland Steel Company at Sparrows Point, and second on the list was the New York Shipbuilding Company, at Camden, N. J., which, if government vessels be included, enjoyed the reputation for the largest output of the year. For tonnage under construction the Newport News Shipbuilding Company held the record, with 16 merchant vessels, of 120,399 gross tons under construction, followed by the New York Shipbuilding Company with 22 vessels, of 107,639 gross tons. The William Cramp and Sons' Ship and Engine Building Company had 13 vessels, of 71,500 gross tons, and the Union Iron Works had 10 vessels, of 69,240 tons.

The list might be continued so as to include practically all American yards capable of modern ship construction, and to the merchant steamships might be added the government construction, of which 5 vessels, with an aggregate displacement tonnage of 63,450 gross tons, were building at the New York Shipbuilding Company, and 2 vessels, of 63,400 tons, at the Newport News Shipbuilding and Dry Dock Company.

On the Pacific Coast the Union Iron Works of San Francisco built during the year 2 vessels of about 6000 gross tons, each fitted with Curtis turbines, also a launch oil tanker, of 7445 gross tons, fitted with Curtis turbines, of 2600 horse power. This yard had under construction in the same year 6 large oil tankers, 2 being 8000 gross tons; and 4 of 7445 gross tons each, a twin screw turbine driven passenger and freight steamer, of 9728 gross tons, for the Matson Navigation Company, and a freighter of 5900 gross tons, with Curtis turbines, for the Hind-Rolph

Company. At Seattle, 2 freight steamers, of 3900 gross tons each, for the New York and Cuba Mail Steamship Company, were under construction, as well as some submarines and a destroyer for the United States navy.

On the Great Lakes the largest vessels being built were four bulk freighters at Lorain, Ohio, at the yards of the American Shipbuilding Company, of 6400 gross tons. The American Shipbuilding Company completed during the year the self-unloading bulk freighter *W. F. White*, of 7180 gross tons, for the Limestone Transportation Company. At Detroit, Mich., the Great Lakes Engineering Company delivered 10 vessels aggregating 9603 gross tons, in 1915, and had under construction 11 vessels, of 31,347 gross tons; 3 passenger cargo steamers, of 1414 gross tons each, for the Clyde Steamship Company, were part of its output, while the work in hand at the end of the year included a bulk freighter, of 7800 gross tons, and a self unloading freighter of 4810 gross tons, as well as 2 cargo steamers of 2500 gross tons each.

The construction of ships in Germany to replace those captured by the Allies was not very active, and the merchant ships launched during the war were ordered before the commencement of hostilities. German naval yards were prosperous with naval orders, but the shipbuilding industries, and especially the smaller yards, were said to have suffered from the great lack of skilled labor, the very great increase in the cost of material, and the difficulty of procuring the latter. As a result the smaller yards were working on an average, 56 hours per week; while the large shipbuilding yards, on the other hand, were busy day and night.

In Japan some 43 ships, ranging from 7300 to 1100 tons, were under construction during the year in various ship yards, which were operating day and night. At the Mitsu Bishi yard in Nagasaki, 4 ships with a tonnage of 7300 each and 2 of 3700 tons each were being built. At the Kobe yards of the same company, 1 1800-ton and 2 5300-ton vessels were on the ways. At Kobe, the Kawasaki yards were building 1 1700-ton, 1 3000-ton, 2 4000-ton and 3 7300-ton boats.

Other important work being executed at the different ship yards was: Osaka Iron Foundry, Osaka, 6 7300-ton, 1 5000-ton, 12 3200-ton and 1 1100-ton craft; Uraga Dockyard Co., Uraga, 4 2200-ton vessels.

SHIPPING. The shipping interests of the world during 1915 presented a most striking and interesting situation. Here more than anywhere were illustrated the commercial aspect of the war, and the change in conditions due to the interference with the ordinary routine of commerce. The merchant marine of Germany and Austria had been driven from the sea, destroyed, or forced to intern in their own or neutral ports, over 6,000,000 tons being rendered useless in this way, while on the other hand the submarines and commerce raiders of the Teutonic allies had destroyed freight and passenger vessels, and had produced a condition which had its effect on freight and insurance rates, and also restricted to a greater or less degree passenger travel, which shrunk to the most meagre dimensions. While the amount of shipping destroyed by the German submarines did not bulk large in determining the grand total, yet it had to be considered. The interference due to "blockades,"

and the establishment of war zones, had their effect on neutral shipping, as did also embargoes and the definition of various contraband articles, as well as the sale of war supplies by neutral powers to belligerents. The blockade of German ports naturally restricted a certain amount of the world's commerce that hitherto had gone to and from the Teutonic empires and neighboring countries, while the increased demands made upon the United States, both for munitions of war and for ordinary supplies from Europe, as well as from South America and Africa, which previously largely had been supplied from Europe, led to an increase of ocean traffic so far as the United States was concerned. A change in the shipping laws brought about by the Ship Registry Act of Aug. 18, 1914, brought under the United States flag a greater increase in tonnage and values than ever previously had been added to the American merchant fleet.

TONNAGE LOST IN 1915. While shipbuilding (q.v.) was active in the United States and in some of the European countries, though not coming up to the normal average, yet the question of the change in the world's total tonnage, due to the losses of ships in the war was an important consideration of the year. According to records obtained from the best official and commercial sources, and published in the *New York Journal of Commerce and Commercial Bulletin*, in the first 17 months of the war, ended Dec. 31, 1915, approximately 990 merchant vessels of all classes and types, with an estimated gross tonnage of 1,878,003 tons, had been destroyed directly or indirectly; these figures being presented as conservative, as in certain cases the tonnage of ships destroyed was not available. The flag under which these ships sailed, and the number and tonnage actually destroyed, as well as the number and tonnage owned in each country, are given in the accompanying summary. The tonnage given in the tonnage owned by each of the nations is gross for the steam vessels and net for the sailing vessels included therein:

Flag	Steam and Sailing Vessels Owned According to Lloyd's Register Book, 1915-1916		Gross Tons of Sail and Steam Vessels Destroyed in War (17 Months)	
	No.	Tons	No.	Tons
Un. Kingdom.....	9,285	19,541,864	602	1,192,551
British Colonies....	2,068	1,732,700		
* United States....	2,580	3,522,913	7	14,087
Austria-Hungary...	433	1,018,210	6	18,240
Danish.....	835	854,966	29	33,293
Dutch.....	809	1,522,547	21	36,843
French.....	1,539	2,285,728	54	125,978
German.....	2,166	4,708,027	65	161,888
Italian.....	1,177	1,736,545	24	60,217
† Japanese.....	1,155	1,826,029	8	16,415
Norwegian.....	2,174	2,529,188	77	108,023
Russian.....	1,256	1,054,762	81	84,193
Spanish.....	642	899,204	...	...
Swedish.....	1,462	1,122,883	85	32,667

* Excluding vessels trading on the Great Lakes of North America. † Japanese sailing vessels are not inserted in Lloyd's "Register Year Book," and are therefore not included in these tables.

In the table are included vessels of all types, but the total number of ships lost by Great Britain, 602, may be divided into 338 merchant steamers and 264 trawlers, sailing vessels, etc. The loss in tonnage by Great Britain, whose merchant marine aggregated 21,274,061 tons

gross, on June 30, 1914, according to *Lloyd's*, during the 17 months of the war was 1,192,551 tons, while Germany, whose gross tonnage on the same date aggregated 4,706,027, had lost through actual destruction only about 65 vessels of approximately 161,888 tons, but a large number of German and Austrian vessels were hurried to safety in various neutral ports at the outbreak of the war and were there at the close of 1915. The war's destruction, affecting as it did all nations, involved a loss of 50 steamers of over 5000 tons, whose names are given in the accompanying summary, as many of these vessels are familiar for their transatlantic associations or otherwise.

Large merchant steamers destroyed as a result of the war, August, 1914, to December, 1915:

	Gross tons		Gross tons
Lusitania (Br.)	30,396	Marquette (Br.)	7,057
C a p Trafalgar (Ger.)	18,710	Californian (Br.)	6,223
Kr. Wilhelm der Grosse (Ger.)	13,952	Lumina (Br.)	6,218
Oceanic (Br.)	17,274	Commodore (Br.)	5,858
Vandeyk (Br.)	10,828	Floride (Fr.)	6,629
La Correntina (Br.)	8,250	Guatemala (Fr.)	5,913
Elsinore (Br.)	6,542	Yunnan (Fr.)	6,474
Navarra (Ger.)	5,974	A miral Hamelin (Fr.)	5,050
City of Winchester (Br.)	6,601	Ancona (Ital.)	8,210
Baden (Ger.)	7,676	Porto Said	5,167
Kaipara (Br.)	7,892	Yasukuni M a r u (Jap.)	5,118
Cormorant (Br.)	7,595	Yasaka Maru	8,297
Higl'd Brae (Br.)	7,684	Maryland (Dan.)	5,136
Lovat (Br.)	6,102	Konigin E m m a (Dutch)	9,181
San Will'do (Br.)	6,458	Eemdyk (Dutch)	6,180
Troilus (Br.)	7,562	R e c h i d Pasha (Turk.)	8,000
Princess Irene (Br.)	6,000	Orteric (Br.)	6,585
India (Br.)	7,940	Persia (Br.)	7,974
Royal Edward (Br.)	11,117	Glengyle (Br.)	9,395
Iberian (Br.)	5,223	D a n t e Aleghieri (Ital.)	9,754
Armenian (Br.)	8,825	Ville de la Crotat (Fr.)	6,378
Arabic (Br.)	15,801	Dagla (Fr.)	5,600
Windoor (Br.)	6,055		
Baron Erskine (Br.)	5,585		
Hesperian (Br.)	9,599		
Urbis (Br.)	6,651		

While no figures were forthcoming as to the value of the cargoes lost with these vessels, yet a summary of losses of the British War Risk Association showed that during the first 12 months of the war the value of cargoes lost in British ships amounted to about \$35,000,000, with an estimated value of cargoes carried during the same period of \$7,500,000,000, or .48 per cent of the total value.

FREIGHT RATES. Everywhere during 1915 freight rates increased, as did also insurance, and for those who owned merchant steamers, tramps, as well as liners, and even sailing ves-

sels, the year was particularly profitable. For example, in England the Peninsula and Oriental Navigation Company, with net profits of £421,160, showed a gain of £140,000 over 1913-14. From American ports freight and cargoes were available far in excess of the facilities for carrying them, and late in the year congestion, particularly at the harbor of New York, but also at various other Atlantic ports, was a serious condition, affecting local as well as foreign commerce, and leading to railway embargoes on freight from the interior. Clearances from the United States for foreign ports increased during the year, and the operations of the Panama Canal until closed by slides had a stimulating effect on American commerce, both between the coasts and the insular territory as well as to Asia and South America. The interruption of the Isthmian traffic (see PANAMA CANAL), however, was a very serious commercial misfortune of the year, as much shipping was tied up that could have been profitably used, and some vessels were required to make the voyage through the Straits of Magellan, with a corresponding consumption of time, when they could have been far more profitably employed.

Some idea of the increase of freight rates may be had from the accompanying summary of comparative rates for wheat and cotton from the United States to Great Britain for periods of five and six years.

Average for 3 months (Sept.-Nov.)	Wheat, per bu.		Cotton, per 100 lbs.	
	*To U. K. (for orders)	To L'pool N. Y. cents	To L'pool from N. Y. cents	To L'pool from N. Orleans cents
1915	86.1	37.3	125.8	129.7
1914	88.2	9.1	40.6	55.2
1913	39.5	5.1	30.8	42.3
1912	29.5	10.2	45.8	63.2
1911	20.9	5.8	25.8	41.4
1910	19.9	3.7	20.0	36.5

Av. for year—

1914	21.0	7.5	30.8	41.8
1913	21.0	5.6	29.8	42.3
1912	24.1	7.7	36.9	52.7
1911	18.3	4.2	20.2	35.3
1910	17.5	3.1	17.1	31.1

* To United Kingdom (for orders) from Portland, Oreg., Tacoma, and Seattle.

WORLD'S SHIPPING IN 1915. In the accompanying table are given the number and net and gross tonnage of steam and sailing vessels of over 100 tons, of the several countries of the world, as recorded in *Lloyd's Register* for 1915-16.

Flag	Number	Steam Net tons	Gross tons	Sail Number	Net tons	Total Number	Tonnage
British:							
United Kingdom	8,675	11,760,277	19,285,705	610	305,668	9,285	19,541,368
Colonies	1,543	930,764	1,595,213	525	137,487	2,068	1,732,700
Total	10,218	12,691,041	20,880,918	1,135	443,150	11,353	21,274,068
American (U. S.):							
Sea	1,233	1,655,718	2,579,645	1,847	948,288	2,580	3,522,933
Northern lakes	569	1,681,788	2,231,074	31	92,323	600	2,323,397
Philippine Islands	61	26,549	44,029	8	2,280	69	46,309
Total	1,863	3,364,055	4,854,748	1,886	1,037,891	3,249	5,892,639
Argentine	245	110,199	188,771	72	33,762	317	222,538
Austro-Hungarian	422	630,840	1,016,695	11	1,515	433	1,018,210
Belgian	159	170,961	269,252	5	7,175	164	276,427
Brazilian	391	182,323	302,513	52	14,901	443	317,414
Chilean	98	68,749	100,320	30	28,272	128	128,592
Chinese	79	61,839	97,536	2	543	81	98,079
Cuban	42	21,748	35,895	6	2,487	48	37,882

Flag	Number	Steam		Sail		Total	
		Net tons	Gross tons	Number	Net tons	Number	Tonnage
Danish	586	474,278	803,701	249	51,295	835	854,996
Dutch	710	922,860	1,498,519	99	24,028	809	1,522,547
French	1,016	1,090,809	1,909,609	523	376,119	1,539	2,285,728
German	1,897	2,661,945	4,419,167	269	286,860	2,166	4,706,027
Greek	433	561,880	892,991	77	15,784	510	908,725
Italian	655	925,464	1,513,681	522	222,914	1,177	1,736,545
Japanese	1,155	1,162,881	1,826,068	...	...	1,155	1,826,068
Mexican	42	28,803	39,294	10	3,888	52	42,682
Norwegian	1,658	1,179,568	1,977,809	516	551,879	2,174	2,529,188
Peruvian	18	15,126	28,608	48	25,141	66	53,749
Portuguese	104	55,610	92,425	102	30,801	206	122,726
Rumanian	33	30,560	54,210	1	898	34	54,603
Russian	744	498,105	851,951	512	202,811	1,256	1,054,762
Spanish	588	539,134	885,755	54	18,449	642	899,204
Swedish	1,090	594,808	1,021,796	372	101,087	1,462	1,122,883
Turkish	145	67,163	115,842	67	17,820	212	138,162
Uruguayan	40	22,253	36,561	12	11,179	52	47,740
Other countries: Albania, Bulgaria, Colombia, Costa Rica, Ecuador, Egypt, Haiti, Honduras, Liberia, Montenegro, Nicaragua, Oman, Panama, Persia, Salvador, Samos, Sarawak, Siam, Tunis, Venezuela, Zanzibar, etc.	82	38,098	65,623	80	28,967	162	94,590
The world	24,508	28,159,895	45,729,208	6,212	8,582,561	30,720	49,261,769

Comparison of American merchant marine of 1914 and 1915, United States Commissioner of Navigation report, 1915:

Classification		1914		1915	
		No.	Gross tons	No.	Gross tons
Barges—					
Wood	1,033	116,878	1,090	126,660	
Metal	16	5,831	16	5,474	
Total	1,049	121,709	1,106	132,134	
Total registered ..		2,405	1,076,152	2,794	1,871,543
Enrolled and licensed:					
Sail—					
Wood	5,861	960,820	5,162	758,621	
Metal	126	242,651	123	236,290	
Total	5,987	1,202,971	5,285	994,911	
Steam—					
Wood	12,567	997,975	4,435	833,086	
Metal	2,040	3,704,677	1,950	3,614,858	
Total	14,607	4,702,652	6,385	4,447,944	
Gas a—					
Wood	...	...	8,387	136,151	
Metal	...	...	69	9,869	
Total	...	...	8,456	146,020	
Canal, wood ...	700	76,454	560	61,979	
Barges—					
Wood	3,058	756,180	3,027	751,220	
Metal	186	114,279	194	115,812	
Total	3,244	870,459	3,221	867,032	
Total enrolled and licensed ..		24,538	6,852,586	28,907	6,517,886
Grand total ..		26,943	7,928,688	26,701	8,389,429
CONSTRUCTION DURING THE YEAR					
Geographical distribution					
Atlantic and Gulf coasts		554	215,141	540	171,422
Porto Rico		3	64	6	35
Pacific coast		330	36,420	318	31,601
Hawaii		2	75	8	98
Northern lakes ...		180	56,541	147	16,467
Western rivers ...		182	8,009	144	5,499
Total	1,151	316,250	1,157	225,122	
Power and material					
Sail:					
Wood	51	13,749	51	8,021	
Metal	...	...	...	...	
Total	51	13,749	51	8,021	
Steam:					
Wood	677	28,614	82	14,852	
Metal	101	195,611	59	127,597	
Total	778	224,225	141	142,449	

Classification	1914		1915	
	No.	Gross tons	No.	Gross tons
Gas: a				
Wood			601	11,114
Metal			9	1,427
Total			610	12,541
Canal, wood	25	2,558	40	4,457
Barges:				
Wood	276	65,898	308	55,828
Metal	21	9,820	7	1,826
Total	397	75,718	815	57,654
Total construction	1,151	316,250	1,157	225,122
a Included in steam prior to 1915.				
b Includes 2 concrete barges of 565 gross tons.				

TRANSFERS TO AMERICAN FLAG. The passage by Congress of the Act of Aug. 18, 1914, involved changes of serious importance to the American merchant marine. In fact the situation was compared with that existing in 1863 and 1864, when 523,064 tons of American shipping was sold to foreigners to escape risk of capture by the Confederate cruisers. On the other hand, in the fiscal year 1915 148 vessels of 523,361 gross tons, were transferred from other nationalities to the American flag and registered. Of these, 96 of 332,258 gross tons, were formerly under the British flag; 30, of 147,742 gross tons, under the German flag; 5, of 17,401 gross tons, under the Cuban flag; 6, of 10,549 gross tons, under the Belgian flag; 5, of 5452 gross tons, under the Mexican flag; 1, of 5275 gross tons, under the Rumanian flag; 1, of 1352 gross tons, under the Uruguayan flag; 1, of 1381 gross tons, under the Chilean flag; 2, of 1349 gross tons, under the Norwegian flag. These 148 vessels were owned by 63 different owners, the Standard Oil Company of New Jersey owning 25, of 130,322 gross tons; the United Fruit Company, 24, of 113,243 gross tons; and the United States Steel Products Company, 10, of 48,271 gross tons; and 44 individuals or corporations owning each a single ship.

In many cases, however, the transfer of these vessels did not involve a change in the actual beneficiary ownership, as they really belonged to Americans but were operated under foreign flags for superior advantages so conferred. They were said to represent an investment of \$33,393,275.58, though probably nine-tenths of this capital had been invested by Americans long before the outbreak of the war. This addition gave the United States second place in the foreign trade of the world, as shown by the preceding table, and of the 305 large ocean steamers in excess of 3000 tons flying its flag in 1915, 90 were registered in the 10 months from September, 1914, to June, 1915. While the tonnage under the American flag increased by 460,471 gross tons, the number of vessels decreased 242, as 593 sailing vessels less were shown on the list, and the decline in the number with the increase in total tonnage, is a tendency of modern water transportation. Whether there would be a general transfer back again to foreign flags of vessels admitted to American registry was one of the questions that was discussed during the year. Such action would be possible under the existing law, but it was not anticipated in view of the change of conditions in Europe and the increased taxation likely to result.

The transfer of ships from citizens of one nation to another, and especially of those coun-

tries engaged in war, was also a topic actively discussed during the year. Regulations or statutes were put in force in Great Britain, France, and Germany, forbidding or regulating the transfer to enemies, or even to neutrals, and the United States Bureau of Navigation compiled during the year summaries of the various laws and rules on this subject. An important publication was also issued by the Bureau of Navigation dealing with the conditions and regulation for ship registry in the various countries of the world.

LA FOLLETTE SEAMEN'S LAW. The La Follette Seamen's Law enacted March 4, 1915, provoked much discussion during the year. So far as American ships were concerned it became effective on Nov. 4, 1915, and for foreign vessels on March 4, 1916. This act required a language test, namely, that 75 per cent of the crew, on American owned or operated ships, should "understand any order given by the officers of such vessel"; that 65 per cent of the deck crews employed on American vessels should ultimately be able seamen, having passed physical and professional examinations by government officers; made less serious the offense of desertion by members of a ship's crew under special conditions; required half payment of wages to the crew in every port; and required a refusal of clearance to a vessel where upon information to the collector it was stated that the provisions of the act relating to language and full quota of able seamen, had not been complied with. This act, which it was alleged had been passed largely at the demand of the Seamen's Union and other persons interested in the cause of labor, was found to possess many impractical provisions, so that the construction of its language, as made by the Department of Commerce, which was charged with its enforcement, essentially modified it in many respects, but at the same time did not entirely eliminate criticism, and several American steamship lines sold their ships, claiming that it was impossible to carry on business under the changed conditions. The solicitor of the Department of Commerce presented an opinion which was endorsed by the Attorney General stating that a section of the law relating to equipment did not apply to vessels of foreign nations having laws "approximating" the laws in the United States, and also that the provisions of the Seamen's Act did not apply to vessels granted American registry under the merchant ship registry act of August, 1914. Furthermore, the department construed rather liberally the language test, so that only the ordinary orders necessary to navigation given by officers need be understood. The act was publicly approved by Secretary of Labor Wilson, by several economists, by its labor sponsors, and others, but was regarded in the main as a makeshift measure, which, even if its good intentions were approved, was badly drawn and would require amendment or repeal.

The shipping situation so far as it concerned American exports was in a serious condition in 1915. According to the secretary of the treasury in a report made Jan. 25, 1915, ocean freight rates on grain from New York to Rotterdam had been increased since the outbreak of the war 900 per cent—on flour 500 per cent—on cotton 700 per cent—and from New York to Liverpool the rates on the same commodities were increased from 300 to 500 per cent; and from Galveston to

Liverpool the rates on grain were increased 174 per cent—cotton 361 per cent—and from other ports along the Atlantic Coast in much the same ratio. It was proposed that the government should build or purchase merchant ships to be used in times of peace as merchantmen, and in time of war as naval auxiliaries, and Mr. McAdoo, secretary of the treasury, outlined a programme for adoption by Congress which contemplated the building of merchant vessels of 500,000 gross tons. This or a similar measure which figured in President Wilson's message of December 6th was likely to be considered by Congress in 1916, notwithstanding its failure in the previous Congress. It was opposed by shipping interests generally, and by those who objected to government ownership and control, the latter claiming that the necessary tonnage would not be forthcoming in time to assist in removing the conditions causing so much trouble in 1915, while under its conditions ordinary laws of supply and demand would govern, and that legislation encouraging the growth of an American merchant marine could take some more practical and direct form.

After the enactment of the Seamen's Law, the Pacific Mail Steamship Company, the Robert Dollar, and the Great Northern Steamship Company announced that they would have to give up the Pacific trade. As a result, the number of Japanese steamers increased from 22 in November, 1914, to 42 on a corresponding date in the following year, with an increased tonnage from 89,932 to 141,262. The situation seemed to be that until further adjustment of shipping statutes was made the American transpacific trade would be in the hands of Japan, and possibly of ships operated under the flag of China or other nations.

The Pacific Mail Steamship Company which, since 1848, had been an important factor in American commerce, decided to abandon the operation of its Pacific fleet and went into liquidation. The Pacific Mail Steamship Company sold to the International Mercantile Marine Company, for use on the Atlantic Transport line, its five large transpacific steamers—*Manchuria*, *Mongolia*, *Siberia*, *Corea*, and *China*, for which the International Merchant Marine paid \$5,250,000; while its fleet of seven smaller vessels, ranging from 3900 to 7800 tons, and operated on the Pacific Coast, was secured by the American International Corporation, a new American company formed during the year, with a capital of \$50,000,000, for \$1,250,000. The latter company announced that they had secured the co-operation of W. R. Grace & Company, for many years in the South American shipping business and trade, to operate the vessels of the new line.

For matters concerned with the subject of shipping, see also section *Commerce* under various countries.

SHIP REGISTRY. See SHIPBUILDING.

SHIPWRECKS. See SAFETY AT SEA.

SHOES. See BOOTS AND SHOES.

SHOOTING. The national rifle shooting matches in 1915 were held at State Camp, near Jacksonville, Fla., the winners being as follows: Individual, Sergeant J. S. Stewart, 1st C. C., Massachusetts, score, 315; team, class A., National Trophy, United States Infantry, score, 3646; class B., Hilton Trophy, Pennsylvania, score, 3563; class C., Marathon Trophy, Kentucky, score, 3518; pistol, 1st Lieutenant J. D.

Garland, 3rd Indiana Infantry, score, 721; united service, National Guard team, score, 2228.

The any-revolver championship was won by D. A. Atkinson of Pittsburgh with a score of 475, while the pocket revolver title went to J. H. Snook of Columbus, Ohio, who made a score of 214. In the target pistol contest George Armstrong of San Francisco established a new record of 478.

W. H. Cochrane of Bristol, Tenn., won the Inter-State Association Southern trap-shooting tournament with a score of 97 out of a possible 100. The winner of the Western tournament, William J. Raup of Portage, Wis., made the same total in capturing this fixture. The Grand American trap-shooting tournament was held at Chicago, L. B. Clark of that city being the victor in the handicap match with a total of 96 out of a possible 100. The other winners were: amateur championship, C. H. Newcomb, Philadelphia, Pa., with 99 ex 100; amateur at double targets, G. V. Deering, Columbus, Ohio, with 91 ex 100.

SHUTTLEFF, ROSWELL MORSE. An American artist and illustrator, died Jan. 6, 1915. He was born at Rindge, N. H., in 1838, and graduated from Dartmouth College in 1857. In the same year he began work as an architect. He attended evening classes in drawing at the Lowell Institute in 1859. In 1860-61 he worked as an illustrator and attended the Academy of Design in New York City. He enlisted in April, 1861, in the 99th New York Volunteers, and was promoted to be lieutenant. Taken prisoner, he spent nearly eight months in Southern hospitals and prisons, and was finally released on parole. After the war he was engaged for several years as an illustrator for magazines and books in New York City. In 1870 he began to paint in oils, at first animal pictures, later landscapes, in both oils and water colors. He was elected an associate of the National Academy in 1881, and a member in 1890. He was also a member of the American Water Color Society.

SIAM. An independent kingdom of south-eastern Asia. It extends approximately from the 6th to the 20th degree of north latitude and from the 97th to the 106th degree of east longitude; its length from north to south is approximately 1020 miles, and its greatest breadth, 480 miles. The coast line is 1300 miles in length. Total area, about 198,900 square miles. Bangkok is the capital.

POPULATION, ETC. The country is divided into 17 monthons (circles), subdivided into 79 muangs (provinces), which are again subdivided into 409 amphurs (districts); these are in turn made up of 3993 tambons (villages), divided into mu bans (hamlets). According to an official report issued in November, 1910, the population of the kingdom was 7,561,977; of whom lay males numbered 3,707,466 and lay females 3,729,021, and persons in holy orders, 142,636. A later report raised the number of inhabitants to 8,149,487. Chinese coolie immigration 1912, 68,361; emigration, 45,986. There are upwards of 200 Europeans and Americans resident in Siam, mostly in Bangkok. That city has 628,675 inhabitants, of whom 107,018 are Chinese. There are government-aided private schools, and several missions. The religion of the court is Buddhism, and large educational powers are in the hands of the Buddhist monks.

PRODUCTION. Agriculture is carried on under

primitive conditions. Wooden plows are used, drawn by water buffaloes in the stiff lowland clays and by bullocks on the sandier highlands. Irrigation is practiced, and rice is the leading crop. Some of the varieties grown are considered by experts to be among the finest in the world. The product next in importance after rice is teak. The forests in which this species occurs are situated for the most part in the monthons of Bayap, Nakonsawan, and Pitsanulok, and are leased to private companies for a term of years, usually 15. Rosewood and other valuable timbers are found in lower Siam, and efforts are being made to work them upon a commercial basis.

The only minerals worked on a commercial scale are tin and wolfram. Seven-eighths of the tin comes from the Puket monthon. Since the cession to the French of the Pailin district (1907) the gem industry has ceased to be of importance; gems are found near Krat and elsewhere, but their value is negligible.

COMMERCE. The total imports for 1912-13 were valued at 76,225,000 ticals, and the exports at 81,971,000. The United Kingdom contributed imports valued at 20,622,000 ticals and received exports valued at 3,013,000 ticals; China, 15,286,000 and 212,000; British India, 8,222,000 and 2,008,000; Germany 5,668,000 and 4,194,000; Singapore, 5,326,000 and 36,870,000; Dutch East Indies, 5,959,000 and 475,000; Hongkong, 1,445,000 and 25,343,000; Switzerland, 561,000 and 13,000; other countries, 13,136,000 and 9,843,000. The export of rice in 1912-13 was valued at 65,320,000 ticals (1 tical = 37.085 cents); teak, 5,600,000 ticals. Total imports 1911-12, 73,139,000 ticals (United Kingdom, 17,971,000; Singapore, 11,078,000; China, 10,024,000; Hongkong, 8,741,000; British India, 5,034,000; Germany, 4,783,000; Dutch possessions, 3,026,000); total exports, 84,634,000 (through Singapore, 40,111,000; Hongkong, 25,618,000). Rice exports 1911-12, 65,841,000 ticals; teak, 6,113,000. Import of cotton goods in the 1910-11 trade, 11,808,211 ticals; silk goods, 3,744,304; gunny sacks, 3,453,391; provisions, 4,775,442; oil, 3,636,652; machinery, hardware, etc. Export of rice in 1910-11, 17,588,349 piculs, valued at 91,060,879 ticals; buffalo- and cow-hides, 1,267,940 ticals; bullocks, 248,820; buffalo horns, 190,571; other horns, 39,732; hogs, 226,923; fish (plato), 849,613; other fish, 729,723; dried mussels, 460,012; pepper, 689,070; rough rubies, 30,000; tin oxide, 15,943; etc.

There were entered at the ports in the 1912-13 trade, 664 steamers, of 566,172 tons; cleared, 677, of 569,316. Entered 1911-12, 735 steamers, of 624,608 tons. The merchant marine in 1913 included 33 steamers, of 8621 tons, and 45 sail, of 3612.

COMMUNICATIONS. State railways had a length in 1912 of 1024 kilometers (636 miles). The total length (April, 1911) of state and private railways was 1093 kilometers, of which 106 kilometers were privately owned narrow-gauge lines and 987 belonged to the state, as follows: Bangkok to Korat, 264 kilometers; the Lopburi line, 42 kilometers, which constitutes a section of the projected Northern Railway; the Southwestern, 151.5 kilometers, from Bangkok via Nakonchaisi to the Mekong, thence south to Petchaburi; another section of the Northern, 118 kilometers, Lopburi to Paknampoh, with extension to Pitsanulok; 138 kilometers. The first section of the Eastern line, from Bangkok to Petriu, 63 kilo-

meters, was opened in January, 1908; the section of the Northern, from Pitsanulok to Ban Dara, 67.7 kilometers, on Nov. 11, 1908; the section Ban Dara, Utaradit, Pang Ton Phung, 52.5 kilometers, Aug. 15, 1909, together with a branch from Ban Dara to Sawankalok, 29 kilometers. The Pang Ton Phung to Meh Puak line, 19 kilometers, replaced the caravan route from Utaradit to Phrae over the Kao Plung Pass. The ultimate terminus of the Southern Railway is the Kelantan boundary, by an extension from Trang, a total distance of 970 kilometers (distance from Petchaburi to Trang, 676 kilometers). A survey of the Siamese Southern Railway to the Kelantan boundary was completed to a point at Kampong Rantan Panjang. This determined where this line would link up with the Federated Malay States system, which previously had completed its line to the Golok River, the frontier between Siam and Kelantan. Telegraph lines, 9457 kilometers (5876 miles), with 10,628 kilometers (6604 miles) of wires and 152 stations. Post offices, 223.

FINANCE. The budget for 1913-14 estimated the revenue at 65,093,654 ticals and the expenditure at 79,827,482 (65,599,423 ordinary, 15,228,059 extraordinary). The estimated revenue in 1911-12 was 62,321,000 ticals. Ordinary expenditure, 62,235,539; for railway construction, 9,660,670; for irrigation, 2,014,399—total extraordinary, 11,675,069; making a total estimated expenditure of 73,910,608. The public debt Dec. 31, 1914, stood at £6,257,000; paper currency (March 31, 1913), 26,051,070 ticals. The reserve fund, established under the Gold Standard act (1908), stands at £945,941, held entirely in gold, and reserved absolutely for the purpose of maintaining the stability of exchange.

GOVERNMENT. The government is an absolute monarchy, and succession is limited to the princes of the blood ranking highest among the King's sons. The present King being without male issue, the succession passes presumptively through the line of the Queen-Mother's sons according to their respective ages. Reigning King (Somdetch Phra Paramindr), Maha Vajiravudh; born Jan. 1, 1881; proclaimed successor and crown prince, 1895; succeeded to the throne Oct. 23, 1910.

SIERRA LEONE. A British colony and protectorate on the west coast of Africa, bounded by French Guinea and Liberia. The area of the colony is about 4000 square miles; population (1911), 75,572, of whom 702 white. Freetown, the capital, with the best harbor in West Africa, had 34,090 inhabitants. In 1913 the birth rate in Freetown was 17, and the death rate 23. The protectorate has an area of about 27,000 square miles; its population in 1911 was placed at 1,327,560.

Sierra Leone's leading export is palm kernels, valued in 1913 at £920,943; the export of kola nuts amounted to £328,003; other exports are palm oil, ginger, and piassava. Statistics of trade and finance for successive years:

	1911	1912	1913	1914
	£	£	£	£
Imports . . .	1,274,081	1,424,864	1,750,308	1,405,049
Exports . . .	1,807,088	1,540,754	1,781,252	1,250,478
Revenue . . .	457,759	559,855	618,588	675,689
Expend. . . .	432,448	524,417	622,439	680,146
Shipping * . .	2,487,577	2,676,471	2,931,085	.....

* Tonnage entered and cleared.

A government railway (the first railway in British West Africa) extends east southeast from Freetown to Pendembu, near the Liberian frontier, 227½ miles. From Boia Junction (64 miles from Freetown) a branch runs northeast to Makene, about 83 miles (completed in 1913), and a further extension to Baga is under construction. Telegraph and telephone line, 468 miles.

SILESIA. See AUSTRIA-HUNGARY; and GERMANY.

SILICATES. See MINERALOGY.

SILK. The year 1914, because of the war, had been somewhat disastrous to the silk industry. As the business in Europe was stopped, demand was curtailed, and in the United States a drop in raw silk values and depreciation in manufactured goods resulted. The shipments to the United States, however, had continued about the same in amount, so that at the opening of the year 1915 American manufacturers were ready to undertake new business, and for the first six months of 1915 slightly more raw silk was shipped to the United States than in the corresponding period for 1914, with a notable increase in Italian silk, amounting to 72 per cent, and a decrease of 17 per cent in Japanese silk. Canton silk had increased some 76 per cent and China silk about 6 per cent. Tussah silks had increased almost double. On the other hand, in Europe, for the season 1914 to 1915, the principal silk conditioning works in Italy, France, and Switzerland reported a decrease in material treated in the season 1914-15, when the amount was 11,309,474 kilos, from 21,563,168 kilos in 1913-14. These figures do not take into consideration similar plants in Germany and Austria, which in 1913-14 had treated 1,522,994 kilos, and the minor works of France and Italy, which in the same year handled 980,982. In 1915 the silk crop of Italy was far below normal, due to the war conditions, adverse weather, and other misfortunes, so that the crop was estimated at 36 per cent, with shortages in Piedmont, Lombardy, and Veneto, and in Central and Southern Italy.

The total production of the leading European sources of raw silk was estimated as follows, in the annual review of the *American Silk Journal*:

	1915		1914
	Kilos		Kilos
Italy	2,900,000	against	4,060,000
France	100,000	"	400,000
Austria-Hungary	150,000	"	300,000
Spain	50,000	"	70,000
	3,200,000		4,830,000

War conditions naturally affected the Levant, and the crop of Brutia was much reduced, as was also that of the Caucasus and Turkestan, which was only 40 per cent of normal, although the total was not a matter of extraordinary importance. In Japan, the first crop was lower than expected, the second crop normal, and the third, or autumn crop, poor, so that in place of 200,000 bales for 1914, the 1915 production was estimated at not over 160,000 to 170,000 bales. In China the production of steam filatures was expected in 1915 to run as in 1914, while the Tsatlee crop fell short of normal, and the Tussah crop was about 20 per cent short. In Canton the first three crops yielded but 17,000 bales in 1915, as against 23,000 bales in 1914.

Silk manufacturers in the United States during the year enjoyed increased prosperity, especially as regards the broad silk industry, and at the end of the year an improvement was looked for in ribbons. The demand for silk and cotton mixtures continued to increase, for knitting and other purposes, and fashion seemed favorable to the extensive use of silk. The throwing mills all over the country were reported active and every spindle turning, and large new mills were being erected, as well as additions to existing plants. (See TEXTILE MANUFACTURING.) In Europe it was reported that the silk industry in France and Switzerland was returning to a normal condition, with 60 per cent of full capacity being maintained by the mills at Lyons, and with even better reports from mills at Zurich and Como. In the United States the dyestuff situation assumed a serious character early in the year, and manufacturers were warned by the committee on dyestuffs of the United Silk Association to be very careful in assuming guarantees for the delivery of dark colored material and to encourage the use of light shades. The embargo on logwood, announced during the year, was also a serious matter and manufacturers were interested in every effort to establish an American dye industry. Silk mills during 1915 continued the tendency to concentrate in New Jersey and Pennsylvania, and some nine-tenths of the construction for the year was in that section. The establishment of new plants at Shamokin and Kulpmount, Pa., and Paterson; the building of a large new weaving mill at Hazleton and a 40,000-spindle throwing mill at Dorrancetown, Pa., and a new plant at Port Jervis, N. Y., were features of the year. Many idle mills had been reorganized and started up and there were many small concerns started in the tenement mills of Paterson. See also AGRICULTURE.

The statistics offered in the accompanying table are estimates of the American Silk Association. The second table provides information concerning silk imports.

THE SILK CROP OF THE WORLD			
Silk	1914-1915	1913-1914	
Crop in Pounds	Pounds	Pounds	
Europe	10,714,000	9,837,000	
Viz. Italy	8,995,000	7,804,000	
France	898,000	772,000	
Austria	672,000	580,000	
Spain	154,000	181,000	
Levant	3,428,000	5,004,000	
Asia, total quantity exported ..	32,218,000	42,874,000	
Viz. China, Shanghai	6,604,000	9,975,000	
China, Canton	4,168,000	5,995,000	
Japan, Yokohama	21,358,000	26,650,000	
Indian, estimated	88,000	254,000	
Total, pounds	46,360,000	57,315,000	
Tussah, raw	2,108,000	2,757,000	
Grand total, pounds ..	48,468,000	59,972,000	

IMPORTS OF SILKS INTO THE UNITED STATES FOR THE FISCAL YEARS 1913-1914 AND 1914-1915

	1914-15		1913-1914	
	Pounds	Value \$	Pounds	Value \$
European ..	2,783,660	10,542,545	2,054,800	8,892,876
Japans ..	17,833,419	60,249,516	19,830,768	73,593,186
Cantons ..	2,282,969	6,152,487	1,978,405	6,218,871
Chinas ..	2,090,883	6,858,208	2,546,532	8,697,793
Tussahs & Doppioni ..	876,295	938,191	1,216,378	1,864,548
Totals ..	25,867,226	84,785,897	27,126,878	99,266,274

SILVER. The production of silver in the United States in 1914 was 72,455,100 fine ounces, valued at \$40,067,700. This is an increase of \$5,653,600 over the production of 1913, but a decrease in commercial value of \$280,400. Nevada was the largest producer in 1914—15,455,491 fine ounces. Idaho was second—12,479,516. The total silver production in 1915 was 67,485,600 fine ounces, a decrease of 4,969,500 ounces from 1914. The greatest losses in silver were in Idaho and Nevada, the other large silver-producing States very nearly holding their own. The following table from the United States Mint shows the production of silver in the United States in 1914 and 1915 by States:

	Silver: Fine Oz.	
	1914	1915
Alabama	300	.....
Alaska	865,900	838,100
Arizona	4,489,500	5,078,100
California	2,020,800	2,110,900
Colorado	8,804,400	7,895,100
Georgia	100	100
Idaho	12,578,800	10,595,800
Illinois	1,900	2,200
Maryland	100	100
Michigan	415,500	495,400
Missouri	60,000	56,400
Montana	12,536,700	12,690,200
Nevada	15,877,200	18,793,000
New Mexico	1,771,800	1,907,100
North Carolina	1,500	1,400
Oklahoma	6,200	.....
Oregon	147,400	126,500
South Carolina	179,800	195,400
South Dakota	102,800	141,000
Tennessee	574,700	720,400
Texas	11,722,000	11,168,500
Utah .....	.....	100
Vermont	1,500	1,100
Virginia	841,300	154,000
Washington	100	700
Wyoming .....	.....	.....
Continental United States....	72,444,800	67,471,000
Porto Rico .....	.....	.....
Philippines	10,800	14,500
Totals	72,455,100	67,485,600

The table below shows the average price of silver by months, in New York in 1915:

MONTHLY AVERAGE PRICE OF SILVER		
Month	1914	1915
January	57.572	48.855
February	57.506	48.477
March	58.067	50.241
April	58.519	50.250
May	58.175	49.915
June	58.471	49.084
July	54.678	47.519
August	54.344	47.168
September	58.290	48.680
October	50.654	49.885
November	49.082	51.714
December	49.875	54.971

The imports in silver in 1914 were valued at \$25,959,187, and the exports, \$51,603,060. See also METALLURGY.

SINGAPORE. One of the Straits Settlements (q.v.).

SING SING PRISON. See PENOLOGY, *Osborne* and *Sing Sing*.

SKATING. The international outdoor amateur championships were held at Saranac Lake in February. Russell Wheeler of Montreal made the best showing, capturing the 220-yard, 440-yard, half-mile, and two-mile races—of 260 points. The one-mile was won by H. Cody of Toronto, Canada, and the three-mile race by Anton O'Sicky of Cleveland, Ohio.

In the international indoor championships contested at Cleveland, Ohio, Wheeler made practically a sweep of the more important races.

The world's championships were not held because of the European war.

Ice skating as a recreation reached a stage of popularity in 1915 never before attained. In New York City alone the number of rinks open to the public increased from 12 to 40 and some of the larger hotels were forced by the demand of their patrons to construct "ice palaces." Society took up the craze and for the time the music of the tango was drowned in the clinking of skates. Hockey (q.v.) more than ever found its way into all the leading colleges and preparatory schools, and various amateur and professional leagues were formed by lovers of this sport.

SKRIABIN, ALEXANDER NICHOLAEVICH. Russian composer, died April 27, 1915. He was born on Jan. 10, 1872. He early showed remarkable talent in music, and was a pupil of Safonoff, who, during his term as conductor of the Imperial Musical Society in Moscow, brought Skriabin to that city to produce some of his compositions. The latter had already become known as a composer through the efforts of Joseph Hoffman. In 1891-93 he was professor of piano music at the Moscow Conservatory, and received a gold medal from this institution in 1892. He wrote several minor pieces for the piano, and three symphonies. His *Prometheus* was played at the Queen's Hall, London, in 1914, with the composer at the pianoforte, and on this same occasion of Skriabin's first appearance in England was heard his pianoforte concerto (Op. No. 20), his compositions creating a sensation in London.

SKYSCRAPERS. See ARCHITECTURE, and TALL BUILDINGS.

SLAVIC LANGUAGES. See PHILOLOGY, MODERN.

SLEEPING SICKNESS. While the tsetse fly is known to transmit the trypanosomes which cause sleeping sickness, many of its habits are as yet unknown, although they have been studied for several years. That it sucks the blood of individuals infected with trypanosomes and becomes the carrier and transmitter of them, is unquestioned. The question has arisen as to whether the tsetse flies feed entirely on blood, or whether other varieties of food are acceptable to them. With the object of solving the question, the members of the Scientific Commission of the Royal Society of London, directed by Sir David Bruce, examined the alimentary tracts of a large number of flies caught in Nyassaland. Microscopic inspection showed that the food of one variety of tsetse, *Glossina morsitans*, undoubtedly consisted mainly of mammalian blood. Of 500 flies examined, 288 were found to contain blood in a recognizable state, although much altered by the digestive process. There seemed to be a predominance of a small type of corpuscles, characteristic of the blood of the hartebeest, waterbuck, and other antelopes. Nucleated blood was recognized in only one per cent of the specimens, and this was probably from birds rather than reptiles. No vegetable matter was found in the intestinal contents, so that it may be safely concluded that mammalian blood is the natural food of this fly.

SLEEPLESSNESS. See PSYCHOLOGY, *Dream and Sleep*.

SMALLPOX. An interesting contribution to our knowledge of this disease is *Quarantine Service Publication No. 3* of the Australian Commonwealth, which gives a history of smallpox in Australia from its settlement in 1788 to 1908. Interesting, though imperfect, accounts are given of three distinct and fatal epidemics among the aborigines, and of 11 epidemics among the white population. The later epidemics have been smaller, the largest comprising only about 154 cases. In almost all instances smallpox has been introduced by vessels, although the disease has been endemic to a slight extent since its first introduction. As early as 1872 Dr. McCrae of Victoria suggested that flies might be concerned in the spread of smallpox. Estimates made from the data available indicate that in the last 50 years about 32 per cent of the population had been vaccinated. The effects of vaccination in the epidemics recorded are in line with the history of vaccination in other countries, the vastly larger percentage of the mortality, which has not been great, occurring among the unvaccinated, next among those not revaccinated within the recognized period of immunity, and least among the recently vaccinated or those revaccinated within a proper interval before exposure. Among the latter it is said that almost permanent immunity is attained. See **VITAL STATISTICS**.

SMITH, FRANCIS HOPKINSON. American engineer, painter, and novelist. He was born at Baltimore, Md., on Oct. 23, 1838, and died on April 7, 1915. He was the grandson of Francis Hopkinson, the revolutionary poet. Early in life he was employed as a clerk in an iron works, and later was educated as a mechanical engineer. Becoming an engineer and contractor, he built the sea-wall around Governor's Island, and that at Tompkinsville, S. I.; erected the Race Rock Lighthouse off New London, Conn.; and laid the foundation for the Bartholdi Statue of Liberty. Smith's work as an artist consisted, for the most part, of charcoal work, landscapes in water colors, and illustrations. For his art work he was awarded a bronze medal at the Buffalo Exposition in 1901, a silver medal at the Charleston Exposition in 1902, and in the latter year also gold medals from the Philadelphia Art Club, and from the American Art Society. Equally gifted as an author, his writings include: *Old Lines in New Black and White* (1885); *Well-Worn Roads* (1886); *A White Umbrella in Mexico* (1889); *A Book of the Tile Club* (1890); *Colonel Carter, of Cartersville* (1891); *A Day at Laguerre's* (1892); *American Illustrators* (1892); *A Gentleman Vagabond and Some Others* (1895); *Tom Grogan* (1896); *Venice of To-day* (1896); *Gondola Days* (1897); *Caleb West* (1898); *The Other Fellow* (1899); *The Fortunes of Oliver Horn* (1902); *The Under Dog* (1903); *Colonel Carter's Christmas* (1903); *At Close Range* (1905); *The Wood Fire in No. 3* (1905); *The Tides of Barnegat* (1906); *The Veiled Lady* (1907); *The Romance of an Old Fashioned Gentleman* (1907); *Old Fashioned Folk* (1907); *Captain Thomas A. Scott, Master Diver* (1908); *Peter* (1908); *Forty Minutes Late* (1909); *Kennedy Square* (1911); *Arm Chair at the Inn* (1912); *Charcoals of New and Old New York* (1912); *In Thackeray's London* (1913); *In Dickens's London* (1914); *Felix O'Day* (1915); *Outdoor Sketching* (1915). Smith's works were

published by Scribner in the Beacon edition in 20 volumes, and in the *Library of Modern Authors* series in 18 volumes, and by Houghton in the Uniform edition in 9 volumes.

SMITH COLLEGE. An institution for higher education, founded in Northampton, Mass., in 1871. The enrollment in all departments in the autumn of 1915 was 1924. The faculty numbered 165. There were no notable changes in the membership of the faculty during the year, and no noteworthy benefactions were received. The productive funds of the college at the end of the fiscal year 1914-15 amounted to \$2,182,296, and the income for that year to \$136,310. The library contained approximately 50,000 volumes. The president in 1915 was Marion L. Burton.

SMITH-HUGHES BILL. See **EDUCATION IN THE UNITED STATES, Federal Aid for Vocational Training**.

SMITH-LEVER ACT. See **AGRICULTURAL EXTENSION WORK; AGRICULTURAL LEGISLATION; and EDUCATION IN THE UNITED STATES, Federal Aid for Vocational Training**.

SMITHSONIAN EXPEDITION. See **EXPLORATION, Asia**.

SMITHSONIAN INSTITUTION, THE. A scientific organization, created by an act of Congress in 1846, for the advancement of human knowledge through research and investigation. As a part of the world-wide activities of the Institution, its secretary, Charles D. Walcott, continued his geological explorations in the Rocky Mountains of Canada and Montana, paying particular attention to fossil algal remains, of which large collections were made. For the season of 1915 Walcott planned investigations in Yellowstone Park.

During the summer of 1914 E. O. Ulrich and R. S. Bassler of the museum engaged in stratigraphic studies in Central Tennessee. They discovered that the black shale in Northern Tennessee passes into the overlying Mississippian (Kinderhook) shales, and found that the Stones River or Lower Chazy rocks of Central Tennessee are succeeded immediately by the lowest Black River or Lowville formation.

Frank Springer in 1914 made collections of fossil echinoderms along the new Erie Canal in Western New York for the Springer collection in the museum. In Montana Charles W. Gilmore, of the National Museum, discovered the fragmentary remains of a fossil bird related to *Hesperornis* in the Judith River formation.

The collecting expedition of H. C. Raven in Borneo was completed, after nearly two years, in September, 1914. The work yielded about 3000 valuable specimens of birds and mammals. The zoological explorations in Manchuria and Northeastern China were continued by Arthur de C. Sowerby.

In preparation of unpublished volumes of *Birds of North and Middle America*, Robert Ridgway conducted careful studies of bird life in Southern Illinois. It was found in this region that the passenger pigeon, wild turkey, and ruffed grouse had completely disappeared, and that several other species were nearly exterminated.

The expedition of John B. Henderson, a regent of the Smithsonian Institution, in his yacht, *Eolis*, to Western Cuba, resulted in a large collection of marine organisms from Cardenas Bay, as well as land shells from the Cubitas Mountains.

The South American botanical explorations, carried on by J. N. Rose with the coöperation of the Carnegie Institution, yielded 3000 specimens of cacti during the summer and fall of 1914 from explorations in Peru and Chile. Early in 1915 Rose began investigations on the east coast of South America.

Anthropological expeditions were sent to Africa under Dr. V. Schüek, and to Siberia under Dr. Poniatowski. For discoveries in anthropology and ethnology during the year, see ANTHROPOLOGY.

Dr. C. Hart Merriam, research associate of the institution, practically completed his studies of the big bears of America in 1915.

In connection with the work of the Langley Aërodynamical Laboratory, the advisory committee, as originally organized, was discontinued for legal reasons, and instead an act of Congress was obtained in 1915 authorizing a national advisory committee for aeronautics. Under the auspices of the Langley Laboratory a number of excellent reports and papers were published.

During the year ending June 30, 1915, the publications of the institution included 6753 printed pages and 655 plates of illustrations. Of the various pamphlets and publications, 132,010 copies were distributed. The latest addition to the *Contributions to Knowledge* series, which now contains 150 memoirs, was the "Langley Memoir on Mechanical Flight." In the *Miscellaneous Collections* series 14 new papers were issued, including a paper on Cambrian geology, by Secretary Walcott. The accessions to the Smithsonian Library, deposited in the Library of Congress, numbered 24,713 items on June 30, 1915, making a total number of entries of 521,616. The work of the International Exchange Service (for interchange of official government documents), and of the International Catalogue of Scientific Literature, although continued as usual, was greatly curtailed by the European war. See also UNITED STATES NATIONAL MUSEUM.

SMOKE ABATEMENT. The event of the year was the publication in December of a huge volume entitled *Smoke Abatement and Electrification of Railway Terminals in Chicago*. The volume is the result of more than four years' investigation by a large and representative committee of the Chicago Association of Commerce, of which Prof. Wm. F. M. Goss of the University of Illinois was member and chief engineer. The committee was assisted by a large staff of engineering and other experts. As to the electrification of the steam railways entering Chicago the report is adverse. Figures are presented to show that only 12 per cent of the fuel burned

in Chicago is consumed in locomotive furnaces; 22 per cent of the visible smoke of the city is produced by locomotives; while considerably less of the solid and gaseous constituents of Chicago smoke arises from this class of fuel burners. (See accompanying table.) It is estimated that the substitution of electric for steam power on the railways of Chicago would reduce the visible smoke of the whole city by 20 per cent; the solid constituents of the smoke of the city by 5 per cent; and the gaseous constituents by 5 per cent. Moreover, and this is the serious point, the steam railways of Chicago would require a capital outlay, after deducting salvage, of \$178,000,000. With terminal betterments, the outlay would be raised to \$275,000,000. The annual capital charges on the smaller sum, after deducting allowances for benefits, are estimated at \$14,600,000, which is held to make electrification financially impracticable. The feasibility of the electrification of individual roads was not considered. The report should not be regarded as conclusive as to individual railways in Chicago or elsewhere, since a variety of conditions affect each railway electrification problem. The report contains a summary of the previous literature of smoke abatement, from which it is concluded that although the effect of "polluted air" on health is generally agreed to be deleterious, "there exists no accurate method of measuring this harm," nor of determining how much of the harm is due to smoke. It is also concluded that the direct effects of smoke in such amounts as "may ordinarily pervade the atmosphere of a smoky city, are not shown to be detrimental to persons in normal health," but that the long-continued breathing of polluted air lowers the "general physical tone" of human beings. The direct effect of a smoky atmosphere on the sick has been extensively studied as regards tuberculosis and pneumonia. Smoke does not seem to directly hasten the onset or prevent recovery from tuberculosis, but it is "seriously detrimental" to pneumonia patients. Finally, the committee recommends for future action, the creation by the city of Chicago of a Pure Air Commission, with ample funds. This commission should investigate all sources of air pollution, devise remedies, and have power to enforce them. Materials used for street pavements should be subject to the approval of the commission, and it should have supervisory control of street cleaning, the erection and wrecking of buildings, roof cleaning, and the installation of boilers and other furnaces. It should also "be charged with the duty of investigating present practice in the construction and operation of domestic furnaces," with a

RELATIVE IMPORTANCE OF FUEL-CONSUMING SERVICES AS PRODUCERS OF VISIBLE SMOKE AND OF SOLID AND GASEOUS CONSTITUENTS OF SMOKE AT CHICAGO *

	Visible Smoke	Solid Constituents of smoke †	Total	Gaseous Constituents of Smoke	
				Carbon	Sulphur
Steam locomotives	22.06	7.47	10.31	10.11	18.22
Steam vessels	0.74	0.38	0.60	0.55	0.45
High-pressure steam, stationary power and heating plants	44.49	19.84	44.96	40.68	58.70
Low-pressure steam and other stationary heating plants.	3.93	8.60	28.00	23.06	19.78
Gas and coke plants	0.15	0.00	00.00	00.00	00.00
Furnaces for metallurgical	28.68	64.26	21.13	25.60	7.90
manufacturing and other processes					
	100.00	100.00	100.00	100.00	100.00

* From *Smoke Abatement and Electrification of Railway Terminals in Chicago*.

† Soot, cinders and dust; 41 per cent are of non-fuel origin, but are conveyed into the atmosphere by the smoke from furnaces used for metallurgical and other manufacturing processes.

view to improved practice, or if necessary, to a change in the character of the fuels used so as to reduce smoke.

SOAP. See **CHEMISTRY**, **INDUSTRIAL**, *Soap from Sugar*.

SOCIAL ECONOMICS. Since 1900 there has come into general use the term Social Economics, to distinguish a new point of view for the study of economic problems. This viewpoint lays special stress on the humanitarian aspects of industry. It holds with Ruskin that "there is no wealth but life." It consequently lays stress upon the more just distribution of wealth, upon the dangers of industrial occupations to health, life, and limb, and upon the social importance of raising wages and elevating the standards of living of unskilled labor. It consequently contrasts sharply in many respects with the traditional viewpoint of economists and business men, which assumed that the end of economic effort was to increase the volume of production, especially the volume of exports. The new viewpoint largely rejects, therefore, the *laissez faire* doctrine, and relies on investigation of conditions and their causes, education, and legislation, as means of raising the life values of the industrial population.

Other material coming within the scope of this subject will be found under the following headings: **CHILD LABOR**; **LABOR**; **LABOR LEGISLATION**; **MINIMUM WAGE**; **OCCUPATIONAL DISEASES**; **OLD-AGE PENSIONS**; **PENSIONS FOR MOTHERS**; **PROSTITUTION**; **WOMEN IN INDUSTRY**; and **WORKMEN'S COMPENSATION**.

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SOCIAL HYGIENE. See **PROSTITUTION**.

SOCIALISM. According to the most recent statistics available, the total voting strength of the Socialists in all countries was well over 11,000,000; the aggregate membership of Socialist

organizations throughout the world was about 3,000,000. In almost every parliament the Socialists had representatives: in the German Reichstag, 110; in the French Chamber of Deputies, 102; in the Swedish Second Chamber, 87; in the Austrian Abgeordnetenhaus, 83; in the Belgian Chamber, 39; in the Italian Chamber of Deputies, 77; in the British House of Commons, 8 (not including several Socialists elected as Labor representatives). Before the outbreak of the War of the Nations in 1914, there were Socialist parties in 27 countries, all affiliated with the International and, in the interim between International Socialist Congresses, represented by the International Socialist Bureau at Brussels. The effect of the war in disrupting this international organization and in destroying, temporarily at least, the world-wide solidarity of the Socialist movement, was discussed at length in the **YEAR BOOK** for 1914. The present article deals first with the endeavors of the Socialists during the year 1915 to reconstruct the International, and then with the activities of the Socialists in the separate countries.

INTERNATIONAL CONFERENCES. Acting upon the conviction that the Socialists of all nations should exert themselves to restore peace to the world, the Socialist Party of the United States in September, 1914, sent appeals to the Socialists of Great Britain, the Netherlands, Italy, Sweden, Denmark, France, Germany, Austria-Hungary, Switzerland, and Belgium, with the proposal that an international Socialist peace conference should be held. The American invitation availed nothing, however, since it was obviously impossible to bring the Socialists of the warring nations together in a peaceful convention. The Swiss and the Scandinavian Socialists then took up the idea of an international conference, with this modification, that only the Socialists of neutral nations were to be invited. In order to avoid strife, moreover, the conference would refrain from all discussion of the causes of the war as well as of the conduct of the Socialists in the belligerent countries. Only the terms of peace and the means of hastening a peace were to be considered. Such a programme might shield the German Socialists, who were accused of supporting their country in an aggressive war, but it was bound to antagonize all those who saw in German militarism a menace which must be destroyed before any just peace could be made. Not only in France and England was this objection urged. The Spanish Socialists most emphatically affirmed their belief that a victory for the Teutonic Powers would be disastrous for the future of Socialism; that the triumph of the Allies would enable Socialism to make greater progress even in Germany and in Austria; and that peace conference proposals were inopportune while the outcome of the struggle against Austro-German imperialism was still in doubt. The American Socialist Party had intended to send Morris Hillquit as its delegate to the conference. Upon learning, however, that the Socialists of Spain, Switzerland, Italy (then neutral), Bulgaria (then neutral), and Rumania would in all probability hold aloof from the enterprise, and that the only neutral nations represented would be the three Scandinavian states and the Netherlands, Mr. Hillquit determined not to participate. The four countries in question, he believed, would have certain sectional

interests which might not be representative of neutral opinion in general.

"America alone has no interest in this war except in its speedy termination, and American Socialists above all others must studiously avoid even the slightest appearance of bias or discrimination among their unfortunate comrades in Europe. This war will end sometime, and when it ends somebody will have to initiate the work of reconstructing the shattered International of the workers. This great task will logically fall to the Socialists of America, the Socialists of the most important and least concerned nation. I fear that this mission, the largest that will ever come to our movement, may be jeopardized by the participation in a somewhat one-sided conference, and therefore have concluded not to go to Copenhagen."

Notwithstanding such rebuffs, the Scandinavian and the Dutch Socialists persevered and held their peace conference at Copenhagen in January, 1915. Sixteen delegates attended, representing Norway, Denmark, the Netherlands, and Sweden. Capitalism, militarism, imperialism, and secret diplomacy had caused the war, declared the conference, and the same Social Democrats who had in the past incessantly warned Europe against the policies that led to war should now exert all their energies to hasten the restoration of peace. All Socialists were called upon to help formulate just peace proposals, to work for the democratization of diplomacy, to labor for ultimate disarmament, and to urge their several governments to initiate pacific negotiations. It is interesting to note that although the Scandinavian and Dutch Socialists had been suspected of a tendency to condone unduly the actions of the German Social Democrats, the conference in its resolutions strongly condemned the violation of Belgian neutrality, and protested in advance against the forcible annexation of any conquered peoples.

Quite a different sort of international congress was held at London in February by the Socialists of the Allied Powers. Victory, rather than immediate peace, was the chief concern of this gathering. The sentiment was vehemently expressed, perhaps in rather extreme terms, by M. Vaillant, one of the French delegation: "France was forced into the struggle and will not draw back until Prussian militarism has received its death-blow. We have the following message for the German people: that we are fighting for your emancipation as well as for our own national freedom."

The London Conference was quite impartial in reproaching all the Powers for their aggressive imperialism, which had caused the war; it censured Germany and Russia alike for oppressing the Poles; it specifically reprobated the arbitrary methods employed by the Russian government against Socialists, Jews, Poles, and Finns. At the same time, the London Conference was convinced that the worst enemy of freedom was Germany. "A victory of German imperialism would mean the defeat and annihilation of democracy and freedom in Europe." The Socialists of the Allied Powers were fighting, so they declared, not against "the people of Germany or Austria, but only against the governments of these countries, which oppress their peoples." Against the governments of Austria and Germany, the Socialists were determined to fight until victory was won; then, in order to right

past wrongs and to prevent future wars, Belgium must be emancipated and indemnified, the Poles must be permitted to become either autonomous or independent, and "all nations which have been forcefully annexed should be given back the right of disposing of their own freedom." Secret diplomacy and the private manufacture of arms for profit must be done away with. Henceforth nations must be compelled to settle their disputes by arbitration. In this way the victory of the Allies would be a triumph for the people and prepare the way for a peaceful federation of the united states of Europe, and the world.

Neither the Copenhagen Conference nor the London Conference had realized the hope which many Socialists still cherished of demonstrating the undestroyed international solidarity of the Socialist proletarians; the former had represented only a minor group of neutrals, the latter had been frankly belligerent. An International Congress held by Socialist women at Berne in April was a demonstration of solidarity, but did not represent the Socialist parties. The Swiss Socialist Herr Greulich therefore proposed to hold a veritable Socialist Peace Congress at The Hague and outlined a remarkable peace programme including disarmament, the participation of neutral nations in the peace negotiations at the close of the war, the establishment of a United States of Europe with a central parliament, the neutralization of the seas, and the abolition of tariffs. Although Herr Greulich's initiative came to nought, a peace conference was held in September, at the instance of the Italian party. At Zimmerwald in Switzerland, on September 15th, Italian, Rumanian, Bulgarian, German, French, Swedish, Norwegian, Swiss, Polish, Dutch, and Russian Socialists met and agreed to issue a manifesto "To the Proletarians of All Nations." Capitalists and "jingoists" had brought about the war and transformed Europe into a monstrous slaughter-house. No longer deceived by the fair promises of the selfish ruling classes, the workers of the world must cry out in protest against the crime of war; they must condemn the ruthless violation of Belgian neutrality and demand the restoration of Belgian independence; they must lift their voices in warning against any annexations of unwilling peoples at the close of the war. The appeal to the working classes was signed by G. Ledebour (German), A. Hoffman (German), A. Bourderon (French), A. Merrheim (French), G. F. Modigliani (Italian), C. Lazzari (Italian), N. Lenin (Russian), Paul Axelrod (Russian), M. Babroff (Russian), and W. Kolarow (Bulgarian), besides delegates from the Polish, Rumanian, Scandinavian, Dutch, and Swiss Socialists. To be sure the German and French signers did not represent the major Socialist parties of Germany and France, and the entire absence of British delegates was conspicuous (the British government had refused passports to prospective delegates from the Independent Labor Party and the British Socialist Party); nevertheless the Zimmerwald Conference may be regarded as a very important indication of the continued vitality of international Socialism. Consciously reverting to the words of the Communist Manifesto, the Socialists at Zimmerwald once more sent out the old appeal—"Proletarians of all nations, unite!"

INTERNATIONALISM AND THE GERMAN SOCIAL DEMOCRATS. Two facts of supreme importance

in respect of the German Social Democratic Party seemed to be well established at the close of the year 1915. In the first place, it was manifest that whatever their earlier attitude may have been, the more radical members of the party were now thoroughly out of sympathy with the war policy of the German government and unwilling to support longer what they regarded as clearly a war of conquest. In the second place, it was apparent that the majority of the Social Democratic Deputies in the Reichstag were not only heartily in favor of supporting the government, but were doggedly determined to enforce party discipline and compel the radical anti-war minority either to conform to the majority opinion or to secede from the party. In other words, the conflict between internationalism and nationalism threatened to split the German Social Democratic Party. The nationalist position was well defined by Herr Wolfgang Heine, a member of the Social Democratic group of the Reichstag, in a speech at Stuttgart, Feb. 22, 1915. The time to talk about peace, he believed, had not yet come; for the present the German people must trust in the prowess of the German army and in the peace-loving disposition of the German Emperor. In declaring that workingman and employer had a common interest in upholding the state and in fighting for the prosperity of German export trade, Herr Heine did not hesitate to advocate imperialism, withal in the interests of the working classes. Although his views in regard to imperialism were probably somewhat extreme, certainly in his staunch support of the German "war of defense," Herr Heine voiced the common sentiment of the majority of the Socialist Reichstag members. Even after the brilliant German successes against the Russians had removed all immediate danger of foreign invasion and had given German strategy, in appearance, at least, an aggressive character, one of Herr Heine's colleagues, Dr. Albert Südekum, was credited with the statement that the Social Democrats would stand by the flag to the finish and fight until the foes of the German nation were ready to propose peace. The leading antagonist of this pro-war spirit and the boldest critic of the government was Dr. Karl Liebknecht, a member of the Social Democratic group in the Reichstag and also a representative in the Prussian Landtag. He alone had voted against the second war loan on Dec. 2, 1914 (consult the YEAR BOOK for 1914); in a New Year's Message to the Socialists of Great Britain he had advertised to the world the confusion that reigned within the ranks of the German Socialists and the smothered popular repugnance to the war. In consequence of his rebellion against the majority opinion, Dr. Liebknecht was severely censured by his Socialist colleagues in the Reichstag on the triple charge of infringing party discipline, of injuring the interests of German Social Democracy, and of disseminating misleading information abroad. A minority of the group sympathized with Liebknecht's views about the war. The great Socialist journal *Vorwärts*, moreover, which had cautiously but pretty consistently opposed the war policy, even at the risk of suppression, gave evidence of sympathy with Dr. Liebknecht. In reporting a violent speech which Liebknecht delivered in the Prussian Landtag March 2, 1915, attacking the undemocratic Prussian franchise, *Vorwärts* printed the following comment:

"But even if the government . . . refused to heed these words of the Socialist leader, the people will listen to him. We demand the democratization of the government. . . . Democratic control of the government by the people would have prevented the war."

The dissension in the Social Democratic Party became still more noticeable when the third war loan was voted upon by the Reichstag in March, 1915. Herr Scheidemann cast the vote of the Social Democratic group in favor of the loan, but 30 members of the group absented themselves from the sitting, showing that they were willing neither to approve the war loan nor to rebel against their party. Dr. Liebknecht again voted against the majority, and this time he was joined by another Social Democrat, Herr Otto Rühle. (See GERMANY, *History*.) The controversy which ensued in the Socialist press served to divide the two wings of the party still more sharply. Liebknecht himself (according to a letter from Dr. Liebknecht's law firm, printed in the *American Socialist* for May 29th) had been called to the colors. But Kautsky, Haase, Bernstein, and other leading Socialist polemicists took up the attack on the pro-war majority. Herr Haase, while denying any desire to "desert the Fatherland," considered it a serious mistake for the Socialists to vote the war budgets, thus identifying themselves with the government's policies. Local Socialist groups in Stuttgart, in Charlottenburg, and other places, rallied to the Liebknecht party. It was pointed out that whereas the war had begun, ostensibly, as a war of defense against autocratic Russia, it had become more and more a war against democratic France and England. The Germans had not only defended themselves but had actually conquered large portions of the enemies' territory. As a war of conquest, the war was indefensible and should not be supported by Socialists. A manifesto against the war was circulated by the anti-war Socialists. The patriotic wing meanwhile had continued to declare its qualified love of peace. In the Reichstag on March 20th Herr Scheidemann had said, "Now when we are strong and victorious is the time to tell the country through the press that we favor peace on a reasonable basis." Just what constituted a reasonable basis for peace was discussed by a conference of German and Austrian Socialists at Vienna in April. The conference expressed itself in favor of compulsory international arbitration, parliamentary ratification of all international agreements and treaties, concerted disarmament by treaty agreements, and the right of every nation to determine its own destiny. In June, shortly after the German Imperial chancellor in his speech of May 28th had hinted at the intention of the German government to annex certain conquered territories at the conclusion of the war, Bernstein, Haase, and Kautsky published a manifesto declaring that since the war had become frankly aggressive, the duty of Socialists was to abandon their support of the government, disregard the "civic truce" between parties, and resume the class struggle. An "open letter" signed by nine Reichstag Deputies, three Prussian Landtag Representatives, and about 200 other prominent Socialists, rebuked the majority of the Social Democratic Group in the Reichstag for failing to protest against the violation of Belgian neutrality and against the chancellor's annexationist policy. The re-

joinder of the Executive Committee of the Social Democratic Party, published at the end of June, declared that although ardently desirous of peace, and uncompromisingly hostile to aggressive conquests, the Executive Committee nevertheless remained firm in the conviction that, for the reasons stated on Aug. 4, 1914 (see YEAR BOOK, 1914) the Social Democrats must continue to support the German government in the war, especially since the English and French Socialists had traitorously allied themselves with the Russian Czar to crush Germany. The true views of the patriotic wing of the German Social Democratic group were revealed in August, when Dr. Eduard David, one of the most conspicuous of the pro-war Socialists, was chosen to approve the new war credits in the name of the Socialist group. Presently it became known that before taking this action, the Reichstag group and the Party Executive had spent three days in stormy debate over the question of their attitude towards the war. David and the pro-war majority had triumphed over Bernstein and the anti-war minority, and had persuaded the majority to adopt a declaration of policy which was nothing less than a frank acceptance of imperialism, with some socialistic modifications: Alsace-Lorraine was not to be returned to France; "in order to secure free economic development for the German nation," the Social Democrats demanded the Open Door in all colonies, most-favored-nation treatment by all the belligerents, freedom of the seas, and internationalization of important commercial straits; "in the interests of Germany's security and economic freedom of action," they were willing even to support Austria-Hungary and Turkey against partition; no new territory, however, was to be annexed; an international arbitration court was to be set up; and the benefits of social legislation were to be augmented and equalized. Dr. David furthermore expressed the hope of the Social Democratic patriots that a more satisfactory solution of the food problem might be found, that war profits might be taxed, and that the German people, having proved its loyalty in the war, might be admitted to a greater share in the government. The Socialist discussion of the war reached its climax in the winter session of the Reichstag, which began on November 30th. Dr. Karl Liebknecht, whose extreme pacifism had already alienated him from the majority of his colleagues, attempted to embarrass the government by asking a series of searching questions: (1) whether the government was prepared to enter immediately upon peace negotiations; (2) whether the government would abandon secret diplomacy in favor of public control; (3) whether the government would lay before the nation the history of the German entry into Belgium and Luxembourg; (4) whether the government would take measures for the alleviation of economic distress among the masses and seriously undertake to reform its internal policy. Herr Haase, who resigned his position as one of the two leaders of the Social Democratic group in the Reichstag, voiced his desire for peace based upon the rejection of all schemes of conquest. A substantial minority of the Reichstag group manifested its sympathy with this point of view by opposing the war credits. The patriotic majority of the Social Democratic group, however, not only continued to support the government, but also insisted upon reading Dr.

Liebknecht out of the party and repudiating the party organ, *Vorwaerts*, for rebelling against party discipline. The Socialist interpellation of the government, in regard to Germany's peace terms, is discussed in the article on GERMANY, *History, The Debates on Peace Terms*.

AUSTRIA-HUNGARY. In many respects the attitude of the Austro-Hungarian Socialists resembled that of their German comrades. Writing in the *Arbeiter Zeitung* in February, one of the foremost Austrian Socialists, Victor Adler, justified the stand of the German Socialists and expressed the two-fold desire of both German and Austrian Socialists to preserve their countries from defeat and to bring about peace as soon as possible. The Austrian Socialists had tried in vain to prevent the war; they had fought loyally after the war broke out; they were now anxious for peace; and they could not understand the passionately anti-German attitude of the French Socialists. *Le Matin* on December 5th printed a dispatch from Geneva, quoting from the *Volkrecht* what purported to be a manifesto secretly circulated by the Social Democratic Party in Austria; the most striking passages from the manifesto are here reproduced, but the indirect means by which the information was obtained renders the genuineness of the manifesto highly problematical:

"When the civilized world learns what has really occurred in Austria and the way in which justice there has been subverted, it will shudder with horror. We will not speak of the long series of death-sentences passed upon Czech citizens, but simply of the sentences passed against Socialists for no other offense than the interchange of ideas. Langer was condemned to be hanged for publishing a pamphlet demanding peace. That is how the Austrian government acts, while it pretends to be fighting against barbarism. . . . We are going to begin to fight for a democratic republic. . . . What we want, at this moment, is not war but revolution. After the war, we will imitate the French nation, which was able to establish a republic through revolution."

FRANCE. The attitude of the majority of French Socialists has already been made sufficiently clear. They were determined to fight to the bitter end in what they regarded as a struggle for democracy against German militarism. If they won, and they regarded it as the duty of all Socialists to help win, they would vindicate the principle that each nation has the right to independence; they would allow Alsace-Lorraine to return to France; they would guard against future wars by establishing obligatory international arbitration, democratic diplomacy, and an international police force. The National Council of the Unified Socialists, meeting in Paris in the middle of July, showed an overwhelming majority in favor of supporting the war against Germany, and only a minority in favor of immediate peace. M. Sembat, the principal orator, declared that the reconstruction of the International and action for peace were impossible until the Germans had been defeated. The Allies must present a united front. The meeting summed up its attitude by passing a resolution, with only one dissenting voice, expressing the determination of the French Socialists to fight staunchly against German imperialism. This determination was manifested in the participation of the French Socialists in the Allied Socialist Conference in London

(*supra*), as well as in the rejection of an invitation to send delegates to an International Socialist Peace Conference at The Hague. (Regarding the criticism of the French government by Socialists in the Chamber of Deputies, see FRANCE, *History*.) In this connection it may also be noted that a meeting of French labor organizations in August, predominantly Syndicalist rather than Socialist in complexion, declared its desire for peace, its advocacy of compulsory arbitration, its detestation of secret diplomacy and militarism, its belief in the principles of nationalism and internationalism, and its intention of accepting the proposal of the American Federation of Labor for the convocation of an international labor congress on the same date and at the same place as the diplomatic congress at the conclusion of the war. A congress of the Unified Socialists late in December approved the action of the three Socialists who had accepted cabinet offices.

GREAT BRITAIN. Certain of the English Socialists unreservedly adopted the point of view that the war was a fight to the finish against Prussian militarism. A "Socialist National Defense Committee," supported by such influential Socialists as H. G. Wells and Robert Blatchford, insisted that "the human menace of Prussian militarism" must be "destroyed to its very roots"; at the same time it was stipulated that "the British Federation of Free States," i.e. presumably, the British Empire, should be preserved. Practically all British Socialists agreed with the ordinary British patriot in abhorring German militarism and in demanding an indemnity for Belgium as well as a *plébiscite* in Alsace-Lorraine on the question of reannexation to France. The Independent Labor Party, however, was by no means willing to give docile support to the government. Insistently its members demanded national control of industries, taxation of the rich, and increased expenditure on social welfare. The annual convention of the I. L. P. at Norwich early in April desired that peace should be secured "at the earliest possible moment on such conditions as provide the best opportunities for the reestablishment of amicable relations between the workers of Europe." More important was the resolution in which the convention expressed its "strong disapproval of the action of I. L. P. members of Parliament speaking from platforms on which attempts were made to justify the war, and the foreign policy of the Liberal government which led to the war." The I. L. P. was not quite willing, however, to put itself on record as dogmatically opposed to any support of the war, for by a vote of 120 to 121 the conference rejected a resolution that: "This Conference is of the opinion that the Socialists of all nations should agree that henceforth the Socialist parties should refuse support to every war entered into by capitalistic governments, whatever the ostensible object of the war, and even if such war is nominally of a defensive character." The division of the British Socialists on this fundamental question was quite comparable with the dissension within the German party. The British Socialist Party (it should be remembered that there were three Socialist organizations coexistent in the United Kingdom: the British Socialist Party, the Independent Labor Party, and the Fabian Society) was strongly pacifist in temper, and vehemently deprecated the idea of a "fight to a finish." In

its annual conference of 1915, the B. S. P. resolved that "This Conference of the British Socialist Party condemns the cry raised by the capitalist parties in every belligerent country for a fight to a finish . . . and declares unhesitatingly that it is the supreme duty of the Socialist parties throughout the world to work for an immediate peace on such terms as will prevent the repetition of a similar war." In Parliament the British Socialists and Laborites pressed with ever-increasing importunity for a clear and frank statement of the terms upon which the British government would accept peace. In the country, it should be noted, the mass of the trade-unionists (by no means all Socialists) were apparently willing to support the war, but bitterly opposed to conscription (see discussion under the article on GREAT BRITAIN, *History*) and very anxious to safeguard the rights of labor even in the stress and confusion of war-times. In this connection the strikes of the Welsh miners are specially significant (consult the article on STRIKES).

ITALY. Although the Italian Socialists strongly sympathized with France and the Entente Allies in the war, throughout the spring they offered futile resistance to the rising tide of warlike enthusiasm in Italy. Just on the eve of the Italian declaration of war against Austria-Hungary, the Party Executive issued a manifesto, May 22, 1915, declaring that Italy's entry into the war was contrary to the will of the people, and exhorting the Socialists of Italy to remain true to their convictions, in the expectation that after the war, "the curse of the mothers, the wives, the woes of the victims of the unavoidable economic crisis, will give new and stronger impulses to the class struggle. It is for the conflicts of that struggle that we are preparing popular sentiment. The Socialist proletariat does not disarm, it merely waits." The attitude of the Socialists after the outbreak of war was difficult to ascertain, inasmuch as the Italian government exercised a rigid censorship, and press reports were frequently contradictory.

RUSSIA. In January a communication was made public which four Socialist members of the Duma were alleged to have sent to Copenhagen. The Russian Socialists, according to this document, were unable to attend the Socialist Congress at Copenhagen, because they had been arrested; all Socialist organizations had been suppressed by the police; the report of the Duma's proceedings had been mutilated by the government in order to conceal the protest of the Socialists against the war credits. Subsequent reports indicated that one member of the Socialist group in the Duma had been expelled from the Socialist majority organization.

UNITED STATES. At the beginning of the year the Socialists boasted 31 members in 13 State Legislatures: George W. Downing (Cal.), L. A. Spengler (Cal.), E. W. Bowman (Idaho), C. M. Madsen (Ill.), J. M. Mason (Ill.), G. D. Brewer (Kan.), C. H. Morrill (Mass.), A. O. Devold (Minn.), J. W. Woodfill (Minn.), L. A. Bechtel (Mont.), Alexander Mackel (Mont.), W. C. Tharp (N. Mex.), M. J. Scanlan (Nev.), C. A. Steele (Nev.), S. W. Hill (Okla.), C. H. Ingham (Okla.), D. S. Kirkpatrick (Okla.), T. H. McLeomore (Okla.), N. D. Pritchett (Okla.), G. E. Wilson (Okla.), J. H. Maurer (Pa.), J. A. Bevan (Utah), L. A. Arnold (Wis.), H. O. Kent,

(Wis.), Frank Metcalf (Wis.), Carl Minkley (Wis.), W. L. Smith (Wis.), George Tews (Wis.), James Vint (Wis.), Frank J. Weber (Wis.), Edward Zinn (Wis.).

The Socialist legislators gave special prominence to the unemployment question. In California, Mr. Lewis A. Spengler introduced a bill for free State employment agencies and free transportation of workers; his colleague, Mr. Downing, introduced a constitutional amendment empowering the State to employ citizens in productive industrial enterprises. Mr. Bowman, in the Idaho Senate, similarly brought the problem of unemployment to the fore. Congress, too, was deluged with Socialist petitions for measures against unemployment. Second only to their solicitude for the welfare of labor at home was the interest taken by American Socialists in the War of the Nations. Mr. Hillquit's decision not to participate in the Copenhagen Peace Conference (*supra*) gave rise to interesting debates in the Socialist press. Mr. Gustavus Myers, writing for a New York journal, on January 24th, declared that "for the present, the International Socialist movement is bankrupt. . . . No thinking Socialist attempts to deny that the International Socialist Movement is in a desperately sundered condition." Mr. Victor Berger, former Socialist Congressman from Milwaukee, replied to Mr. Myers's strictures on Socialist solidarity. Mr. Berger emphatically denied that the Socialist movement was bankrupt, or that the war would mark the decline of the movement; on the contrary, he believed that International Socialism would emerge stronger than ever and would lead the nations of the world to federation and peace. In the February issue of the *New Review*, Mr. William English Walling, author of an admirable volume on Socialism and the war, animadverted upon the nationalism of Mr. Morris Hillquit (see *YEAR BOOK for 1914, SOCIALISM, United States*). Mr. Hillquit's classic statement of patriotic Socialism, quoted in the *YEAR BOOK for 1914*, was inverted by Mr. Walling to affirm the internationalist conviction that: "Class feeling stands for existence primarily, for the chance to earn a livelihood. It stands for everything we hold dear—home, family, and friends. The workman has a class as well as a country. Even before he has a country." Mr. Hillquit himself was meanwhile exhorting the United States not only incessantly to urge peace upon the European belligerents, but also to set them an example of a nation at peace with the world because at peace with itself. "Let us," he said, "make social peace at home, and we shall be at peace with the world and the world will follow in our lead." Other prominent Socialists were reluctant to exert their influence in favor of immediate peace. Mr. Eugene V. Debs, to cite but one instance, was credited in the *American Socialist* with these words: "We cannot stop the European war. We can and will intervene *when the time comes* and do all in our power to restore peace. To end the war prematurely, were that possible, would simply mean another and perhaps even a bloodier catastrophe." February 12th was observed as "national unemployment day" by Socialists throughout the United States. Late in the same month a monster petition, bearing 100,000 signatures, was sent to Congress, asking for the establishment of national food supply depots and such other facilities

as were necessary to obtain a just market for the producer and a fair purchase price for the consumer. On March 4th, Mr. Meyer London, the sole Socialist member of the national Legislature, took his seat as a member of the House of Representatives. On the same day, Mr. Pat Quinlan began to serve his term in the Trenton (N. J.) State prison for alleged instigation of riots. His condemnation evoked protests from Socialist journals, on the ground that he was innocent of the crime charged against him. Early in April, two Socialists, Mr. William E. Rodriguez and Mr. John C. Kennedy, were elected aldermen from the 15th and 27th wards, respectively, in Chicago, Ill. The National Committee of the Socialist Party, meeting in Chicago, May 13th, decided that the national convention of the Socialist Party should be held in that city in 1916, and elected Mr. Morris Hillquit of New York as chairman, and Mr. Walter Lanfersiek of Kentucky as secretary. A programme of resolutions and proclamations calling attention to the dangerous propaganda of the militarists, advocating the repudiation of war debts, and pledging the Socialists to labor in behalf of a prescribed peace programme at the end of the war, was adopted by majority vote despite objections raised by ex-Mayor Lunn of Schenectady, and Mr. Victor Berger of Milwaukee. The first week in May was henceforth to be observed annually as Socialist Week. The National Committee adopted a draft of a Peace Programme of which the most important items were: no indemnities at the close of the war; no transfer of territories except by consent of the inhabitants; "all countries under foreign rule must be given political independence if demanded by the inhabitants of such countries"; an international congress with permanent committees; a special commission to consider international disputes; international ownership of strategic waterways (Gibraltar, Suez, Panama, etc.); neutralization of the high seas; abolition of the manufacture of arms for private profit; no increase in existing armaments; no military or naval appropriations; eventually, universal disarmament; political democracy; abolition of secret diplomacy; industrial democracy. In November, Rev. George R. Lunn was reelected mayor of Schenectady, N. Y., and Dr. Charles P. Steinmetz, the noted electrician, was elected president of the common council of the same city. Mr. Charles H. Morrill was reelected to the Massachusetts Legislature from the town of Haverhill. A Socialist Assemblyman was returned to the New York State Legislature from a Brooklyn constituency. Candidates nominated for the presidency by Socialist locals included Mr. Eugene V. Debs of Indiana, Mr. Job Harriman of California, Mr. Morris Hillquit of New York, Mr. John C. Kennedy of Chicago, Mr. Meyer London of New York, Mayor Lunn of Schenectady, Mr. Charles Edward Russell, Mr. Seidel of Milwaukee, and Mr. Fred D. Warren of Kansas. Socialism lost one of its veteran organizers when Julius Vahlteich died at Chicago, Feb. 26, 1915. He was one of the 12 founders of the Universal Workingmen's Association (1863); he had been twice elected to the German Reichstag; in 1881 he had been expelled from Germany and found refuge in the United States; he had been editor of the New York *Volkszeitung* and subsequently of the Chicago *Arbeiter Zeitung*.

SOCIAL SERVICE, AMERICAN INSTITUTE OF. An organization formed in 1898 for gathering and disseminating information on all branches of social and industrial betterment. It supplies expert information as to social problems both to persons in the United States and in foreign countries, and has organized hundreds of classes in the United States and Canada for the study of such problems. It maintains a lectureship on social subjects, Dr. James H. Ecob holding that position in 1915. At its headquarters in Bible House, Astor Place, New York City, a special reference library is kept open to the public. The official organ of the institute is the monthly magazine, *The Gospel of the Kingdom*, which is widely used in Sunday schools, church brotherhoods, Y. M. C. A.'s, and Y. W. C. A.'s. In 1916 the magazine will be devoted to welfare and industrial subjects. The officers of the institute are the following: President, Josiah Strong; vice-president, Mornay Williams; recording secretary, Rudolph M. Binder; acting treasurer, M. J. Whitty; and an executive committee consisting of the officers and in addition, Orrin G. Cocks, Robert H. Gardiner, Horace G. Hoadley, William Fellowes Morgan, Gifford Pinchot, Robert Scott, Fred E. Tasker, and Edwin D. Wheelock.

SOCIETIES, ART. For exhibitions held by various societies and associations, see PAINTING AND SCULPTURE.

SOCIETY. For any organization whose official title begins with the word Society, see article under the specifically descriptive word in such title.

SOCIOLOGICAL CONGRESS, SOUTHERN. See SOCIOLOGY.

SOCIOLOGICAL SOCIETY, AMERICAN. See SOCIOLOGY.

SOCIOLOGY. In addition to the matter below, the following articles contain information of sociological interest: SOCIAL ECONOMICS, which includes a list of articles treating different aspects of industrial life; CHARITIES; LABOR; POLITICAL ECONOMY; and RELIEF FOR WAR VICTIMS.

AMERICAN SOCIOLOGICAL SOCIETY. This organization held its 10th annual meeting at Washington, D. C., December 27th-31st. The general subject was "War and Militarism in Their Sociological Aspects." At the same time and place were held sessions of the American Statistical Association (q.v.), the American Economic Association (see POLITICAL ECONOMY), and the second Pan-American Scientific Congress (see POLITICAL ECONOMY). Principal papers of the Sociological Society programme were the address of President Edward A. Ross on "War as Determiner"; a widely quoted paper by ex-President Theodore Roosevelt on "Social Values and National Existence"; Prof. Emily G. Balch of Wellesley College on "War and Militarism in Relation to the Status of Women"; Prof. G. E. Howard of the University of Nebraska on "War and Militarism in Relation to Government and Politics"; and Brooks Adams of Boston on "Can War Be Done Away With?" A joint session with the section on Sociological Medicine of the Pan-American Scientific Congress was devoted to the general subject, "The Relation of the Individual to the Community: Social Utility, Duties of Individuals to the Community and of the Community to Individuals." There were discussions of "Health Matters of Public Interest," by

Mr. Homer Folks of New York, and Dr. Don Ramon López-Lomba, director-general of National Public Charities of Uruguay; on "Ways and Means of Bringing Matters of Public Health to Social Usefulness," by Dr. William C. Woodward of Washington, D. C., and Dr. Eduardo Liceaga of Mexico; and on "What Can Unofficial Effort do for Public Health?" by Prof. Irving Fisher of Yale University, and Dr. Hayes E. Dearholt of the University of Wisconsin.

The society publishes the *American Journal of Sociology*, and a report of its annual conventions, entitled *The Papers and Proceedings of the American Sociological Society*. The secretary is Prof. Scott E. W. Bedford, 58th Street and Ellis Avenue, Chicago, Ill.

SOUTHERN SOCIOLOGICAL CONGRESS. This organization held its fourth annual session at Houston, Texas, in May. During its session it organized a local committee of citizens as a "Continuation Committee," with the especial function of working for public health through existing organizations. This was only one aspect of a four-years' programme for public health which the organization has entered upon. In addition it gives consideration to problems of courts, prisons, child labor, organized charity, race relations, the church, and social service. In its 1915 sessions persons of every profession besides negro leaders, prison reformers, housing commissioners, health officers, and social service experts took part in the discussions. President Samuel P. Brooks of Baylor University, Waco, Texas, was chosen president for 1916. The motto of the congress is "For the South, for the nation, and for civilization."

Bibliography. The following were among the most important books of sociological interest published during the year. Other references will be found under LABOR; PENOLOGY; POLITICAL ECONOMY; PROSTITUTION; SOCIAL ECONOMICS; and various special topics. Katherine Anthony, *Feminism in Germany and Scandinavia*; Charles A. Beard, *Economic Interpretation of American Politics. Vol. II. Economic Origins of Jeffersonian Democracy*; F. W. Blackmar and J. L. Gillen, *Outlines of Sociology*; A. L. Bowley, *Livelihood and Poverty*, and *The Nature and Purpose of the Measurement of Social Phenomena*; Thomas N. Carver, *Essays in Social Justice*; Edwin G. Conklin, *Heredity and Environment in the Development of Men*; Edwin G. Dexter, *Weather Influences*; S. Eldridge, *Problems of Community Life: An Outline of Applied Sociology*; G. F. Elliot, *Prehistoric Man and His Story*; C. A. Ellwood, *The Social Problem*; C. E. Gehlke, *Emile Durkheim's Contributions to Sociological Theory*; Franklin H. Giddings, *The Western Hemisphere in the World of Tomorrow*; John M. Gillette, *The Family and Society*; Arthur Gobineau, *The Inequality of Human Races*; Henry H. Goddard, *The Criminal Imbecile*; Hillystine Goodsell, *The Family as a Social and Educational Institution*; E. B. Gosse, *The Civilization of the Ancient Egyptians*; Edward C. Hayes, *Introduction to the Study of Sociology*; Paul L. Haworth, *America in Ferment*; Julius F. Hecker, *Russian Sociology*; C. R. Henderson, *The Cause and Cure of Crime*; R. Henderson, *Mortality Laws and Statistics*; Frederick C. Howe, *Socialized Germany, and The Modern City and Its Problems*; Maude A. Huttman, *The Establishment of Christianity and the Proscription of Paganism*; J. Jastrow, *Character*

and Temperament; J. H. Jones, *The Economics of War and Conquest. An Examination of Mr. Norman Angell's Economic Doctrines*; Arthur Keith, *The Antiquity of Man*; Albert G. Kellor, *Social Evolution*; Y. K. Leong and L. K. Tao, *Village and Town Life in China*, with a preface by L. T. Hobhouse; James MacKaye, *The Happiness of Nations: A Beginning in Political Engineering*; J. E. McCulloch, *Battling for Social Betterment*; G. W. Nasmyth, *Social Progress and the Darwinian Theory*; Henry Fairfield Osborn, *Men of the Old Stone Age*; Elsie C. Parsons, *Fear and Conventionality, and Social Freedom. A Study of the Conflicts Between Social Classifications and Personality*; W. H. R. Rivers, *The History of Melanesian Society*; James T. Shotwell, and other editors and collaborators, *Records of Civilization*, a series of which was issued *Hellenic Civilization*, by G. W. Botsford; Gilbert Stone, *Wales: Her Origins, Struggles, and Later History, Institutions and Manners*; Mrs. Alec. Tweedie, *Women the World Over*, introduction by Ernest Thompson Seton; and Graham Wallas, *The Great Society: A Psychological Analysis*.

SOILS. As regards the European countries especially there is little to report in the way of progress in the study of soils during 1915. The chief concern there appears to have been the practical application of knowledge already available to the urgent problem of food production, with comparatively little attempt to press inquiries in new fields. The results of scientific study of soils were thus being put to a crucial test and their soundness and practical value were being demonstrated as never before. The wide knowledge of the possibilities and crop adaptations of soils furnished by systematic soil surveys and the exact information regarding the fertilizer and other requirements of soils furnished by scientifically planned and conducted experiments were being found especially useful in the European emergency of 1915.

SOIL SURVEYS. Soil surveys received a large share of attention in those countries which were able to continue such work. The making of such surveys was as heretofore especially active in the United States. A report of the United States Bureau of Soils showed that during the year ended June 30, 1915, detailed soil surveys, usually covering a county, and made on a scale of one inch to the mile, were completed or begun in 97 areas in 32 States, a total area of 40,389.5 square miles, or 25,849,280 acres, being mapped. In addition, reconnaissance surveys, usually covering several counties and made on a scale of 4 miles to the inch, were carried on in 2 States, a total area of 10,161 square miles, or 6,503,040 acres, being mapped. The reports on the detail areas are accompanied by maps which show in addition to the distribution and location of various types of soil the roads, houses, railways, and streams. The total area covered by the detailed soil surveys from the beginning of the work in 1899 to June 30, 1915, amounted to 369,928.5 square miles, or 236,754,240 acres, and by reconnaissance surveys, 444,210 square miles, or 284,294,400 acres. A large part of this survey work (73 out of the 97 areas surveyed in 1915) was done in coöperation with State institutions or organizations, such as agricultural colleges, experiment stations, departments of agriculture, and geological surveys. A few States were conducting independent soil surveys. These

soil surveys were so numerous and so well distributed in the United States that they probably included every soil type of importance and furnished a good basis for judging their agricultural possibilities and adaptations. One of the main practical objects of these surveys was to determine more accurately the best adaptation of soil to crop. With this in mind special studies were being made of the relation of soils to orchard fruits in Massachusetts, Connecticut, and New York, and to truck crops in New Jersey. Classification of lands in the forest reserves with a view to the segregation of those suitable to agriculture and examinations of lands covered by proposed extensions of reclamation projects proceeded as usual.

INVESTIGATIONS. The general, and probably the most notable, outcome of the soil investigations of 1915, was a broadening of the conception of the effects of fertilizers and other treatments on soils. It was made plain that fertilizers could no longer be looked upon as simply supplying plant food (nitrogen, phosphorus, potash, and other deficient constituents), but that they probably performed other very important functions, such as removing or reducing toxicity due to various not yet thoroughly understood causes, correcting excessive acidity or alkalinity, promoting beneficial bacterial activities, stimulating plant growth, and improving physical properties of soils, particularly by their action on colloid substances.

Inquiries into the relation of colloid chemistry to soil properties and processes were actively pressed with notable success. Practically a new field of soil investigation was thus opened up, and the literature of the subject had rapidly grown. The inquiries threw much light upon a number of hitherto imperfectly understood soil reactions.

The causes of the increased productiveness following partial sterilization of soils by heat or volatile antiseptics had not been conclusively determined, but it was shown that the process might have a greater practical value, especially in greenhouse work, than it was heretofore believed to possess. It had been shown that partial sterilization of soils by heat increased the available plant food, produced more healthy conditions in the soil, and saved the expense of frequent change of soils, which is now necessary in greenhouse work.

The paramount importance of moisture in relation to the physical condition of soils was clearly demonstrated by many investigations. As a result of its studies of the subject, the United States Bureau of Soils concluded "that every physical property of a soil affecting the growth of crops is itself determined by the moisture content of the soil and that there is a critical moisture content characteristic of each particular soil at which the aggregate of physical properties produces an optimum condition for plant growth." The Bureau had worked out a quick method of determining this critical or optimum water content. It had been further found by the Bureau that if a soil containing less than the critical moisture content be further wetted enormous pressures (as high as 600 pounds or more to the square inch of soil mass) are developed. This fact has an important bearing on soil tilth, but it is of much more direct importance to engineers and practical constructors. It serves to explain conditions such as

are so notably illustrated in the Panama Canal slides.

Further progress was made during the year in the study of the organic constituents of the soil. The presence in the soil of a new type of organic compounds, namely, aldehydes, was shown by investigations of the Bureau of Soils. These aldehyde compounds, which are considered for the most part harmful to plants, originate in processes of organic decay under conditions of poor aëration or drainage, and appear to be closely associated with acid soils, though not exclusively so. A step in advance in determining the effect of such compounds on plant growth was the testing of them on a large scale in field experiments. Here the results were found to be quite different in many cases from those obtained in small laboratory culture tests. The field experiments also furnished a more satisfactory way of determining the practical value of fertilizers in ameliorating the harmful effects of the compounds. Numerous investigations bearing upon the nature, determination, and correction of the so-called acidity of the soil were reported during the year, but the results were not conclusive as to the nature of the acidity nor the proper methods of its determination and correction.

Bibliography. The following are among the more important contributions to the subject which appeared: Cameron, "Soil Colloids and the Soil Solution," *Journal of Physical Chemistry*, 19 (1915), pp. 1-13; Löhnis, *Boden-Bakterien und Boden-Fruchtbarkeit* (Berlin, 1914); Campbell and Haste, *Soil Culture Primer* (Lincoln, 1914); Lyon et al., *Soils* (New York, 1915); Russell, *Soil Conditions and Plant Growth* (London, 1915); Ehrenberg, *Die Boden-kolloide* (Dresden and Leipzig, 1915).

SOIL TREATMENT. See FERTILIZERS.

SOLAR PHYSICS. See ASTRONOMY.

SOLOGUB, FEODOR. See RUSSIAN LITERATURE.

SOLOMON ISLANDS PROTECTORATE.

Part of the Solomon Islands, including Bougainville and Buka, are German; the remainder of the group to the southeast of these constitute a British protectorate. Estimated area of the protectorate, 14,800 square miles. Estimated population: natives, about 150,000; whites (1914), 660. Head-hunters and cannibals exist among the native tribes. The climate is unhealthy. The British resident commissioner has his headquarters at Tulagi. Imports (1913-14), £162,215; exports, £148,265 (copra, pearl, tortoise shell, etc.); revenue, £24,520; expenditure, £18,737.

SOMALI COAST. See FRENCH SOMALI COAST.

SOMALILAND, ITALIAN. See ITALIAN SOMALILAND.

SOMALILAND PROTECTORATE. A British protectorate on the Gulf of Aden. Area, about 68,000 square miles; population (1911), 302,859, largely nomad Mohammedan tribes. Berbera, Bulhar, and Zeila are the chief ports. Live stock constitutes the wealth of the country. Imports amounted in 1913-14 to £238,218; exports, £216,596; revenue, £29,646; expenditure, £68,646; grant-in-aid (1912-13), £26,000.

In November, 1914, a roving band of dervishes, which had been routed by the Camel Constabulary, returned to harass the friendly tribes in the vicinity of Burao, but was defeated at the

beginning of February by a combined force of the Indian contingent and the Camel Constabulary in the Ain Valley.

SONJATIN. See CHEMISTRY, INDUSTRIAL.

SOUR-MILK THERAPY. See BACTERIOLOGY.

SOUTH, UNIVERSITY OF THE. An institution for higher education, founded at Sewanee, Tenn., in 1861, and opened for instruction in 1868. It includes the College of Arts and Sciences and a theological department, as well as a preparatory department. The total enrollment in all departments in the autumn of 1915, exclusive of 77 in the Sewanee Military Academy, was 155. The faculty numbered 25. There were no notable changes in the membership of the faculty in 1915, and no noteworthy benefactions were received. The productive funds amounted to about \$400,000, and the total income to \$125,000. The library contained about 36,000 volumes. The president is Albion Williamson Knight, D.D.

SOUTH AFRICA, UNION OF. A British colony; a legislative union, under one government, of four provinces. Their areas, according to latest returns, total population (census of May 7, 1911), and their white population (census 1911), with area and population of annexed territories, are shown in the following table:

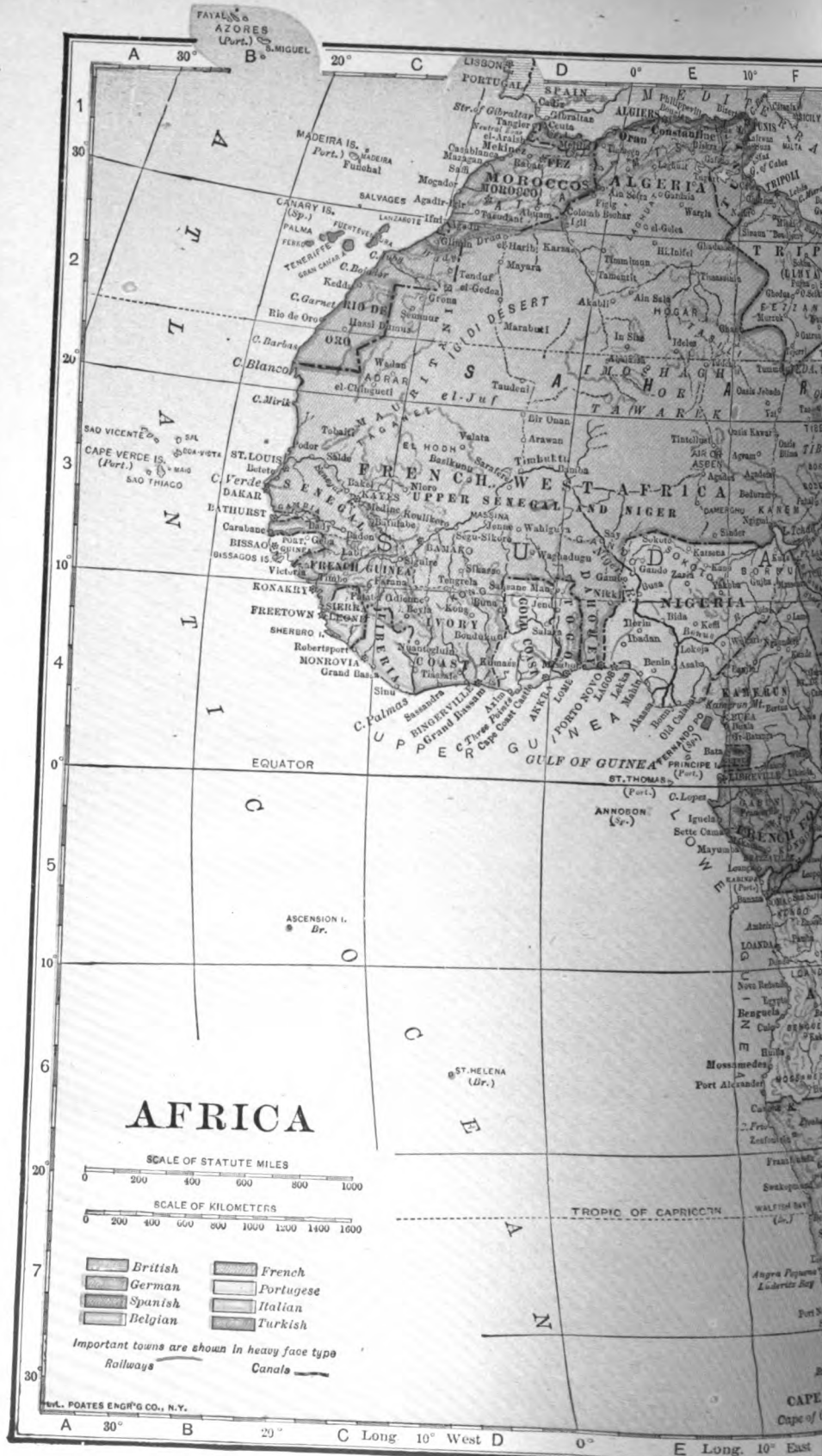
	Sq. miles.	Total pop.	Whites
Cape of Good Hope	206,860	1,553,630	546,162
Bechuanaland	51,524	99,553	14,917
Transkeian Territories:			
East Griqualand	7,594	249,088	7,950
Tembuland	4,129	236,086	8,138
Transkei	2,552	188,895	2,189
Pondoland	8,906	234,637	1,383
Walfish Bay	480	637	32
Total Cape Province	276,995	2,564,965	582,377
Natal	24,866	974,437	95,994
Zululand	10,424	219,606	2,120
Total Natal	35,290	1,194,043	98,114
Transvaal	110,426	1,686,212	420,562
Orange Free State	50,389	528,174	175,189
Total Union of South Africa	473,100	5,973,394	1,276,242

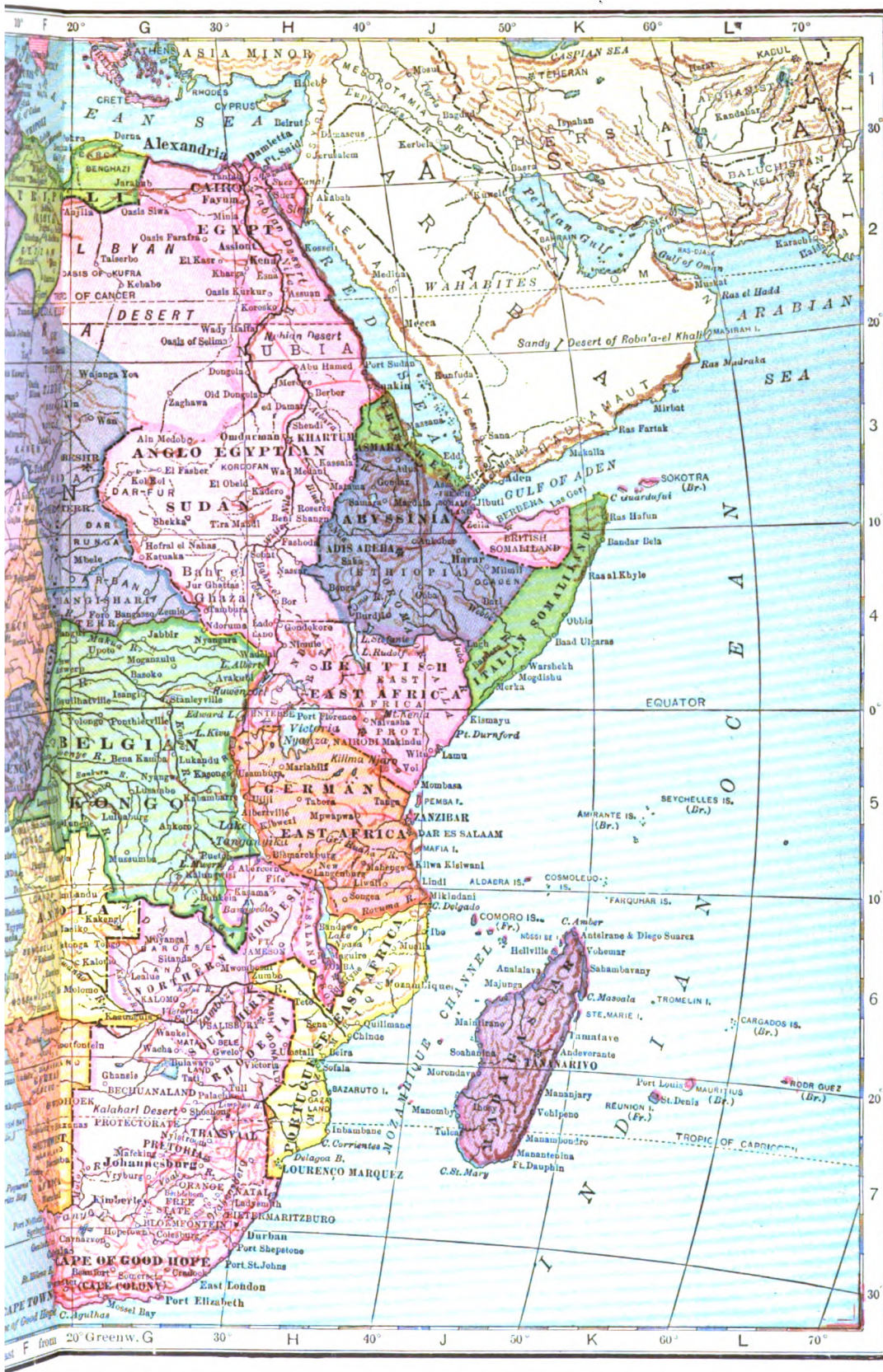
Of the total population, 3,069,392 were males, 2,904,002 females; of the total whites (who numbered 21.37 per cent of the total population), 685,164 were males and 591,078 females. The Bantus numbered 4,019,006 (2,022,949 males and 1,996,057 females), or 67.28 per cent of the total population; mixed and other colored, 678,146, or 11.35 per cent. Density per square mile for the Union, 12.63 (Cape of Good Hope, 9.26; Natal, 33.83; Transvaal, 15.27; Orange Free State, 10.48). The total population in 1904 was 5,175,824.

Cape Town, the seat of the Union Parliament, had, with suburbs, 161,759 inhabitants in 1911 (of whom 85,442 white); Johannesburg, 237,104 (119,953); Pretoria, 57,674 (35,942); Durban, 89,998 (34,880); Port Elizabeth, 37,063 (20,007); Kimberley and Beaconsfield, 44,433 (17,507); Germiston, 54,325 (15,579); East London, 24,606 (14,899); Pietermaritzburg, 30,555 (14,737); Bloemfontein, 26,925 (14,720); Krugersdorp, 55,144 (13,132); Boksburg, 43,628 (11,529); Benoni, 32,560 (8639).

Higher education is controlled by the Union Parliament; other education by the several provinces.

MINING. The Union of South Africa stands





first among the countries of the world in the production of gold and diamonds. Other mineral products are coal, copper, tin, asbestos, graphite, magnesite, zinc, lime, salt, etc.

Gold. The gold produced in the Transvaal amounted in 1910 to more than one-third of the world's supply. Of the 26,198 whites employed in the gold mines of the Union in June, 1911, 26,159 were in the Transvaal, 25 in Natal, 12 in the Orange Free State, and 2 in the Cape province; of the 208,182 colored laborers, 207,907 were in the Transvaal, 216 in Natal, 46 in the Orange Free State, and 13 in the Cape province. Employed in the gold mines in December, 1912, were 24,558 white and 207,618 colored laborers, of whom 24,520 white and 207,456 colored were engaged in the Transvaal; in December, 1913, 22,966 whites and 163,217 colored.

The table below shows the output by provinces in 1912 and 1913:

	Fine ozs.		Pounds sterling	
	1912	1913	1912	1913
Trans.	9,107,512	8,798,386	88,686,250	87,872,949
Natal	1,242	847	5,276	1,473
Cape	88	30	162	131
Union	9,108,792	8,798,713	88,691,688	87,874,558

The total output for the Union in 1910 was £31,991,295 (world's output, 1910, £93,500,000), of which the Transvaal furnished £31,973,123 (from the Witwatersrand, £30,653,933), or 7-527,108 fine ounces. The total output for 1909 was £30,994,905, of which £30,987,650 came from the Transvaal (contribution of the Witwatersrand, £29,787,569).

Diamonds. In June, 1911, 4723 whites were employed in the diamond mines (Cape, 2830; Orange Free State, 1096; Transvaal, 797) and 39,884 colored (Cape, 18,004; Transvaal, 11,254; Orange Free State, 10,626), besides several thousand individual diggers. Employed in the diamond mines in December, 1912, were 8874 white and 52,369 colored laborers; in December, 1913, 8692 white and 53,809 colored (Transvaal, 2279 and 14,791; Cape, 5226 and 28,630; Orange Free State, 1187 and 11,388).

The table below shows the output by provinces in 1912 and 1913:

	Carats		Pounds sterling.	
	1912	1913	1912	1913
Trans.	2,181,406	2,156,897	2,886,979	2,726,668
Cape	2,325,549	2,461,893	6,190,996	6,995,438
O. F. S. ...	614,927	554,757	1,488,544	1,667,706
Union	5,071,882	5,163,547	10,061,489	11,389,807

The output for the year 1910 was 5,456,557 carats, valued at £8,101,363 (Cape, 2,586,294 carats, £5,267,659; Orange Free State, 780,195 carats, £1,505,074; Transvaal, 2,090,068 carats, £1,328,630). The value of the stones obtained from the Cape and Orange Free State mines is greatly in excess of that of the Transvaal diamonds, the latter selling at one time for 13 shillings per carat, when the former were averaging from 42 shillings to 36 shillings.

Coal. White and colored labor employed in coal mines in June, 1911, 1237 and 23,440, respectively (Natal, 517 and 11,248; Transvaal, 504 and 9399; Orange Free State, 101 and 1600; Cape, 116 and 1193). The coal mines employed in December, 1912, 1323 white and 23,277 colored laborers; in December, 1913, 1403 white

and 24,545 colored (Transvaal, 643 and 11,109; Natal, 551 and 10,548; Orange Free State, 131 and 2003; Cape, 78 and 885).

The table below shows the output by provinces in 1912 and 1913:

	Tons*		Pounds sterling	
	1912	1913	1912	1913
Trans.	4,751,850	5,225,086	1,044,986	1,142,598
Natal	2,765,068	2,898,726	771,755	891,699
O. F. S.	525,459	609,973	141,880	167,409
Cape	74,701	67,481	41,257	88,752
Union	8,117,078	8,801,216	1,999,378	2,240,458

* Tons of 2000 lbs.

The Transvaal also produced in 1912, 2960 tons of coke, valued at £3469, and 25,895 gallons of tar, valued at £806. Natal produced 5000 tons of coke, valued at £8511. In 1913 the Transvaal produced 2234 tons of coke, valued at £3039; 43,923 gallons of tar, valued at £1433; Natal, 7111 tons of coke, £12,823.

The output and value in 1910, and the pit's mouth value of the total production to the end of 1910, are given below:

	1910	Total	
	Tons	£	£
Transvaal	3,974,876	987,260	11,722,988
Natal	2,570,115	688,424	*6,849,285
O. F. S.	469,762	181,728	887,498
Cape	98,280	59,808	2,181,807
Union	7,107,533	1,867,220	21,591,078

*From 1908 only.

The Cape province, having less competition, obtains higher prices than the other provinces. Better qualities are found in Natal and the Transvaal. Most of the supply from Natal is bunkered at Durban or exported, while the mines, railways, and other local industries consume much of that produced by the other provinces.

Other Minerals. Of the other mining products, only tin and copper are exploited in commercial quantities, largely in the Transvaal and Cape provinces. Output of tin ore in 1913, 3672 tons, valued at £436,550; of copper, 5289 tons of concentrates, valued at £138,328, from the Transvaal, and 13,095 tons of matte and ore, valued at £369,528, from the Cape. The output of silver (952,597 fine ounces, valued at £115,822) is contained in gold bullion and base metal ores, there being no silver mines in the Union. Salt production, 47,992 tons, valued at £77,142.

OTHER INDUSTRIES. There is an efficient agricultural department, which has established agricultural colleges and experiment stations. Ostrich farming and sheep farming are important industries. Irrigation plans are being carried out on a large scale in various districts. The wool export reached, in 1912, 162,000,000 pounds, and in 1913, 173,242,755 pounds. The dairying industry is developing, the output of butter in 1913 being 10,741,745 pounds, and of cheese, 520,949 pounds. Corn was produced for export in 1910 to the value of £693,413 (178,000 tons); subsequent severe droughts have injured this crop every year. Whale oil (from the whaling station at Durban), £60,000 in 1910. The export of ostrich feathers was 1,023,307 pounds in 1913.

The forest reserve covers 1,843,036 acres. The present annual importation of timber into the

Union is about 14,000,000 cubic feet, largely pine from Europe and America, with some hard wood from Australia. The total revenue from the forest reserve (1912-13) was £107,031; expenditure, £118,865.

COMMERCE. By proclamation dated Aug. 5, 1914, the export of foodstuffs, except by special permit, has been prohibited. In a communication of August 14th, it is specified that: (1) the exports of cereal foodstuffs to overseas countries (except to ports in Great Britain) is absolutely prohibited; (2) the export of cereals for Great Britain is authorized by special permission; (3) the export of all kinds of foodstuffs for consumption in Basutoland, Swaziland, Bechuanaland Protectorate, Rhodesia, Mozambique Province, and the Congo is permitted.

By decision of June 2, 1915, the export of raw cotton has been prohibited for all ports in Europe on the Mediterranean and Black Sea, except ports in France, Russia (not including Baltic ports), Belgium, Spain, and Portugal.

The total value of the imports and exports in the trade of the Union, exclusive of specie, is shown in the table below, for three comparative years:

	1910	1913	1915
Imports	£36,727,367	£38,838,960	£41,828,841
Exports	53,609,840	62,974,219	66,569,864

A table of the principal imports for home consumption, and exports of domestic produce, in the 1913 trade, follows, values in thousands of pounds sterling.

Imports	1000£	Exports	1000£
Foodstuffs	7,584	Gold	37,589
Cotton mfra.	8,211	Diamonds	12,017
Apparel	2,709	Wool	5,719
Hardware	1,931	Feathers	2,984
Leather mfra.	1,657	Coal	1,892
Machinery	2,843	Hides and skins...	2,018
Haberdashery	1,820	Mohair	877
Iron and steel	1,432	Copper	450
Wood, etc.	1,285	Bark	309
Drugs, etc.	965	Tin ore	381
Oils	844	Whale oil	123
Furniture	658	Fish	107
Glycerine	553	Fruit	57
Woolen mfra.	814	Fodder	33

The United Kingdom contributed 54.4 per cent of the imports and received 88.7 per cent of the exports.

During 1913, 4349 vessels, of 12,939,454 tons net, were entered, and 4331 vessels, of 12,911,742 tons, were cleared.

COMMUNICATIONS. On Dec. 31, 1913, the mileage of the government railway lines totaled 8280, of which 7807 miles were of 3-foot 6-inch gauge, and 473 miles of 2-foot gauge, during the year the mileage having been increased 433, or approximately 5.5 per cent. Of the total mileage, 3639 miles were in the Cape province, 2362 in the Transvaal, 1163 in the Orange Free State, 1116 in Natal. Capital expenditure to end of 1913, £68,034,999, plus £14,467,155 in respect of rolling stock—a total of £82,492,154. Gross earnings for the year, £12,388,755; net profit after payment of interest, £571,242. Working expenditure, including renewals, £8,964,690, or 72.36 per cent of the gross revenue.

Important railway work was carried on in British South Africa as a result of the war and to facilitate the invasion of German Southwest Africa by General Botha. This was the con-

nection of the railway systems of Southwest Africa with those of the Union, extending 300 miles from Kalkfontein, in the former German territory, to Prieska, on the Orange River in the British Dominion. As a war measure, in 1914 tracks on the Union gauge were laid from Prieska to a point on the Orange River opposite Upington, reaching the latter point Nov. 20, 1914. After an interval of delay the work was pushed forward, and completed June 25, 1915. The last section of 32 miles was accomplished in 50 hours, which made a new South African record for such work. Through rail connection was maintained. This new railway system promised to have an important bearing on the development of this part of Africa after the conclusion of peace, assuming that the conquered territory remained in the hands of Great Britain. A passenger could enter a compartment at Johannesburg station and alight at Walfish Bay without change. It was stated that the total number of miles of railway construction since the Union until the end of July, 1915, was 1449, while another 950 miles would be ready at the end of the year.

Five armored trains were constructed and manned by employees of the South African Railway in the Woolwich Arsenal of the defense force, during the year 1914, being commanded by officers, and used for patrolling the railways where hostile movements were taking place, and for repairing the line.

FINANCE AND GOVERNMENT. In the table below are shown revenue and expenditure for three comparative years (1914-15 estimate):

	1911-12	1913-14	1914-15
Revenue	£17,869,080	£17,268,178	£17,968,250
Expenditure ..	16,547,380	17,662,014	18,312,194

The total public debt stood, March 31, 1914, at £126,296,250.

The four original provinces form a legislative union under one head—a governor-general appointed by the crown, who, with an executive council (whose members are chosen by him), administers the country as the governor-general in council. The Senate consists of 40 members (8 nominated by the governor-general in council; 32 elected, 8 for each province). The House of Assembly consists of 130 elected members—51 from the Cape of Good Hope, 17 from Natal, 45 from the Transvaal, and 17 from the Orange Free State. Pretoria (Transvaal) is the capital and administrative seat of the executive government; Cape Town, the seat of the Legislature. The Governor-General in 1914 was Viscount Buxton of Newtimber. Gen. Louis Botha, premier since May 31, 1910, resigned Dec. 14, 1912, on account of dissensions between the Dutch and the British on naval and other matters; but he again took office in the same year as premier and minister of agriculture, and in October, 1913, as premier and minister for native affairs.

HISTORY

PUNISHMENT OF THE REBELS. Fear of an invasion of the Union of South Africa by Lieutenant-Colonel Maritz, who escaped to German Southwest Africa in October, 1914 (see YEAR BOOK, 1914), led the Union government early in January to announce that it expected to adopt a system of conscription, as the voluntary plan

of enlistment had failed. On January 24th a force of 1200 rebels under the command of Lieutenant-Colonels Maritz and Kemp attacked Upington in British Bechuanaland but were repulsed with a loss of more than 100 killed, wounded, and prisoners. This was the first attack which Maritz made since his escape from the forces of the Union. Early in February sedition broke out within the Union and a number of arrests were made. Officials of the Botha government accused General Hertzog's Nationalist party of conspiracy against the government. One of those arrested for seditious actions was a member of Parliament and a grandson of the late Paul Krüger, president of the Transvaal. Seventy-one burghers who refused to fight the Germans also were arrested and were convicted. Later, however, their terms were shortened and they were released. On February 3rd Lieutenant-Colonel Kemp and his command of Boer rebels were captured at Upington. Among them were the rebel leader Bezuidenhout and the so-called "Prophet" Vankensburg, who had been able to exercise a great influence over the rebels. One week later an unofficial report gave credence to the rumor that Lieutenant-Colonel Maritz had been executed by the Germans. Maritz had entered into correspondence with the Union government asking for clemency in case he should surrender. The government refused any such terms, but Maritz decided to surrender and to ambuscade a command of Germans at the same time. Accordingly he arranged an attack on Kakamas with the understanding that he should betray the German troops. His treachery was discovered, and he was promptly put to death. The Germans made the attack as planned on Kakamas, but were repulsed. Late in February General De Wet, who had been captured at Waterburg, in British Bechuanaland, on Dec. 1, 1914, was tried on the charge of high treason. Gen. Louis Botha, premier of the Union, made a plea at this time for leniency for the rank and file of the forces of the rebellion, on the belief that most of them were acting under compulsion from their leaders in taking up arms against the government. The Union government issued a *Blue Book* at Cape Town on March 2nd in which it reviewed the causes leading up to the recent rebellion. The government asserted that the revolution had been made possible by the leaders who misrepresented facts to their men, who claimed that the Botha government would not oppose a revolution, and that the ministers actually favored such action, and who stated that the government terms of surrender were all fraud. Finally, the leaders compelled great numbers of men to join them by stating that otherwise they would confiscate their land and cattle. The government attempted at first to put down the revolt without recourse to arms, but finally found it necessary to wipe out the insurrection with the aid of troops. Early in March the Parliament of the Union appointed a Committee of Inquiry to look into the causes of the rebellion. This committee reported in the middle of April that it had not had time to determine the real causes of the revolt, but submitted such facts as it possessed. One member of the committee characterized the insurrection as being the result of ignorance and inexperience in constitutional government and to an anti-English feeling which still persisted to a marked degree. He also characterized Gen-

eral Hertzog, leader of the Nationalists, as deeply culpable even though he had not been convicted of complicity in the plot against the government. In the last of April a Parliamentary paper was issued giving a report of the rebellion. This paper was almost identical with the *Blue Book* issued in March. On May 20th Lieutenant-Colonel Kemp was held for trial on charges of treason and sedition. He pleaded "not guilty" to the first indictment and "guilty" to the second, but later changed that plea also to "not guilty." On July 23rd he was sentenced to seven years in prison and a fine of £1000. At the same time Lieutenant-Colonels Bezuidenhout and Kock were sentenced to five and four years respectively. On June 21st General De Wet, who had been on trial since February, was found guilty on 8 out of 10 counts charging treason and was sentenced to six years' imprisonment and a fine of £2000. Several days later the courts sentenced Gen. W. Wessels, ex-member of the Union Defense Council, to five years' imprisonment and a fine of £1000. Two leaders of lesser importance each were given four years' imprisonment. The imprisonment of these rebel leaders meant the complete extinction of the rebellion.

CAMPAIGN IN GERMAN SOUTHWEST AFRICA. Early in January a small force of the troops of the Union occupied Swakopmund, a German trading and mission post at the mouth of the Swakopmund River in German Southwest Africa. A month later a force of Germans attacked the village of Kakamas in Cape Colony but were repulsed by the Boers. Late in February the forces of the Union began a serious invasion of Southwest Africa. Two armies were landed at Walvisch and Lüderitz Bays, while a third began to work its way north from Cape Colony in order to strike the Germans from the south. Under the command of Gen. Louis Botha, premier and commandant-general of the forces of the Union, these forces worked their way inland, encountering little opposition throughout the month of March, except at Swakopmund where they captured 200 German prisoners and two field pieces. Beginning in April the Union forces began to encounter the German defenders in many small towns along the way. Undeterred by the resistance which was encountered in the form of men, fortifications, and impassable country, the forces of the Union pressed on, occupying in turn Aus, Hasuun, Warmbad, Kalkfontein, Seeheim, Keetmanshoop, Bethany, Karibib, Windhuk, Kaekfeld, Otavi, and Tsumeb. The capture of Winhuk, the capital of German Southwest Africa, on May 12th marked the real end of the German protectorate, although final surrender was delayed till July 9th when Brig-Gen. H. T. Lukin, acting for General Botha, met Governor Seitz and drew up terms of surrender. By these terms the officers of the armies of the protectorate were paroled, the troops were allowed the use of their arms without ammunition, and were sent home, and all of the property of the protectorate was placed at the disposition of the Union.

ANTI-GERMAN FEELING. The sinking of the *Lusitania* by a German submarine produced an outburst of anti-German sentiment in South Africa. The citizens of Johannesburg rose against the German element in the city on the night of May 12th, and before they had ceased

rioting 51 buildings had been wrecked and the contents of all of them burned or smashed. More than 2000 persons were in the raiding party early in the evening when it entered the German Club to the strains of the national anthem, "Rule Britannia," and "Tipperary." Policemen joined the mob instead of helping to disperse it. All of the furniture of the club was thrown into the street and set on fire. Pictures of the German and Austrian Emperors and Bismarck were torn from the walls and trampled on, while the German flag was torn into shreds. An attempt was made to destroy the club, but the fire was confined to the basement. The mob then visited other German establishments in the business part of the city, and by midnight the entire central area was brilliantly lighted by burning buildings and blazing bonfires. The mob broke up at three o'clock in the morning, but six hours later the rioters reassembled and began to loot German stores and warehouses. Occasional rioting occurred the following day, but the civic guard and the Voluntary Citizens' Training Association soon had the city under control. The total damage done in the city amounted to a quarter of a million pounds and slight injuries to three persons. In Durban an equal amount of damage was done, while in Cape Town, Bloemfontein, Port Elizabeth, and Kimberley there also were disturbances. General Botha, writing from German Southwest Africa, deplored these outrages, particularly as many of the sufferers were naturalized citizens. General Botha said in part:

"I hear with profound regret of serious riots in Johannesburg, Cape Town, and elsewhere in the Union and ruthless destruction of private property belonging to enemy subjects and British subjects of German extraction. In many cases the victims have sons loyally fighting with me at the front. I cannot say how deeply I deplore these occurrences. Surely this is not the way to give proof of one's patriotism, nor can it be considered worthy of a strong and chivalrous people, however great the provocation."

Public opinion in the Union strongly favored the prosecution of the rioters, since the greatest sufferers were English insurance companies and English employees thrown out of work.

Late in July General Botha in a speech at a banquet given in his honor explained the reasons why it was necessary for the Union to conquer Southwest Africa. The premier asserted that self-preservation which brought the Empire into war was also responsible for the Union entering the conflict. Among other exhibits, he produced a German map, captured in Southwest Africa, which showed the redistribution of the world after the "Peace of Rome, 1916." On the map all of the territory south of the equator in Africa was included in a greater German Empire, segregating only a small portion as a Boer reserve. Botha and several generals who followed him proclaimed in stirring speeches that unless German Southwest Africa was owned by the Union, the Union would be owned by German Southwest Africa.

PARLIAMENTARY CONFLICT. The implication that the Nationalist party was partially responsible for the rebellion of Maritz, De Wet, and Kemp against the government in no way injured the prestige of the party, and throughout April and May the party became strong in all parts of the Union. At the same time the Botha

party began to weaken. In July in the Nationalist Congress in Bloemfontein, Hertzog outlined his policies on which he based his campaign. They included: (1) an amnesty for men imprisoned on account of their armed protest; (2) a constitutional guarantee of trial before sentence, in order to prevent a repetition of occurrences such as the deportation of certain strike leaders (see 1914 YEAR BOOK); (3) the limiting of the proclamation of martial law to occasions stipulated by law; (4) the amendment of the Defense Act so that the government would not have the right of invading a country in an offensive war and using unwilling men for that purpose. On August 24th the existing Parliament was dissolved, and all parties set about in earnest to carry the elections in October. The successes of General Botha in Southwest Africa in June and July proved a turning point in popular opinion, however, and in the elections on October 24th the Botha party were returned with 54 candidates; the Unionists, who supported Botha, with 40; the Nationalists with 27; Independents, 5; and the Labor party with only 4. It was an overwhelming indication of the approval of the people of the Southwest Africa campaign, regardless of its expense of £16,000,000, and of the decision of the government to send an overseas expedition to the aid of the British. The newly elected Union Parliament was convened at Cape Town on November 19th. Bills were introduced (1) incorporating the South African College into the University at Groote Shuur; (2) granting a separate charter to the Victoria College at Stellenbosch; (3) reconstituting the University of the Cape of Good Hope in accordance with the desires of the other colleges. The majority of the House in the new Parliament enthusiastically supported the Botha government; only a small group of Hertzog Nationalists demanded amnesty for General De Wet and other imprisoned rebels. Although General Botha at first refused this demand, on December 20th the government showed unexpected clemency by announcing that General De Wet and 118 other prisoners, who had been convicted of high treason, would be released.

OVERSEAS EXPEDITION. Early in the year the Union of South Africa decided to send an overseas expedition to aid the Allies in Europe. In July the Imperial government of Great Britain officially announced that it had accepted the offer of the Union government for several artillery batteries, and an Imperial contingent to be raised in the Union. Brig.-Gen. H. T. Lukin, Commandant-General of the Cape Colonial forces, was placed in command of the first brigade of Union troops. Many members of the Union forces which had captured Southwest Africa crossed to England without waiting for the organization of the brigade. Throughout the latter part of the year great progress was made in recruiting and training the members of this expedition.

SOUTH AMERICA. See various South American countries; also **EXPLORATION, South America.**

SOUTH AUSTRALIA. A state of the Commonwealth of Australia. The state covers 380,070 square miles, an area about nine times as large as Tennessee. Population, census of April 3, 1911, 408,558, exclusive of full-blooded aborigines; estimate of June 30, 1914, 438,173. The capital is Adelaide; its population, with suburbs,

was 189,646 in 1911; 1913 estimate, 200,917. Governor, Lieut.-Col. Sir Henry Lionel Galway (since March, 1914); Lieutenant-Governor, Sir Samuel James Way. See AUSTRALIA.

South Australian elections on March 27th resulted in a victory for Labor. A referendum resulted in a vote in favor of closing liquor bars at 6 o'clock instead of at 11 o'clock. Premier Peake's ministry immediately acknowledged its defeat by resigning, and a Labor Executive Council was installed. The new cabinet included Mr. Crawford Vaughan as premier and minister of the treasury and education; Mr. Styles, chief secretary; Mr. Jackson, commissioner of public works; Mr. Blundell, minister of lands, goods, and industry; and Mr. J. H. Vaughan, attorney-general.

SOUTH CAROLINA. POPULATION. The estimated population of the State on July 31, 1915, was 1,607,745. The population in 1910 was 1,515,400.

AGRICULTURE. The acreage, production, and value of the principal crops as estimated by the United States Department of Agriculture, in 1914-15, were as follows:

	Acreage.	Prod. Bu.	Value
Corn 1915	2,155,000	85,558,000	\$80,985,000
..... 1914	1,975,000	86,588,000	88,615,000
Wheat ... 1915	225,000	2,430,000	8,853,000
..... 1914	80,000	920,000	1,334,000
Oats 1915	525,000	9,975,000	6,683,000
..... 1914	375,000	7,500,000	5,325,000
Rye 1915	3,000	30,000	45,000
..... 1914	8,000	84,000	51,000
Rice 1915	3,700	90,000	81,000
..... 1914	6,900	179,000	165,000
Potatoes . 1915	11,000	880,000	1,012,000
..... 1914	11,000	770,000	962,000
Hay 1915	220,000	a 286,000	4,462,000
..... 1914	210,000	242,000	4,114,000
Tobacco . 1915	85,000	b 87,700,000	2,639,000
..... 1914	50,000	86,560,000	3,540,000
Cotton ... 1915	2,400,000	c 1,160,000	62,578,000
..... 1914	2,861,000	1,584,000	50,558,000

a Tons.

b Pounds.

c Bales of 500 pounds gross weight.

LIVE STOCK. The United States Department of Agriculture estimated that on Jan. 1, 1916, and Jan. 1, 1915, horses numbered 80,000 and 83,000, valued at \$11,340,000 and \$10,873,000; mules numbered 171,000 and 166,000, valued at \$27,531,000 and \$24,734,000; milch cows numbered 189,000 and 185,000, valued at \$6,520,000 and \$6,105,000; other cattle numbered 215,000 and 211,000, valued at \$3,311,000 and \$3,081,000; sheep numbered 30,000 and 32,000, valued at \$81,000 and \$83,000; swine numbered 917,000 and 819,000, valued at \$7,794,000 and \$7,043,000. The wool production in 1915 and 1914 was 109,000 and 106,000 pounds respectively.

TRANSPORTATION. The total railway mileage of steam railways in the State on Aug. 1, 1915, was 4466. Railways having the longest mileage were the Southern Line, 1122; the Atlantic Coast Railway Line, 886; and the Sea Board Air Line, 362. During the year the Georgetown and Western Railway was consolidated with the Carolina, Atlantic, and Western. This road built during the year an extension of 57 miles from Andrews to Charleston, and had under construction at the end of the year a line of 85 miles from Charleston to Savannah.

EDUCATION. The total enrollment in the public schools in 1914-15 was 372,841, with an average daily attendance of 256,685. White teach-

ers numbered 4500, and colored teachers about 2800. The total school expenditures for the year were \$3,295,506.

FINANCE. The report of the State treasurer shows the total receipts for the fiscal year 1915 to be \$3,645,363. There was a balance on hand on Dec. 31, 1914, of \$352,718. The total expenditures for the year were \$3,447,423, leaving a cash balance on Dec. 31, 1915, of \$550,658. The public debt of the State on Dec. 31, 1915, amounted to \$5,673,085.

CHARITIES AND CORRECTIONS. A State Board of Charities and Corrections was created by the Legislature of 1915. It began its work on January 1st. The State penal institutions are the State Penitentiary at Columbia, State Reformatory for Negro Boys at Columbia, and the State Farm at Boykin. There is also the South Carolina Industrial School at Florence. The charitable institutions are the State Hospital for the Insane and the Confederate Infirmary, both at Columbia. There is a State Tuberculosis Hospital, but it is not a charitable institution.

POLITICS AND GOVERNMENT. On January 9th Governor Blease issued a general pardon for 1100 prisoners whom he had previously paroled. This brought the total number of prisoners pardoned by him during his four years in office to over 2700. On January 11th he disbanded the organized militia of the State, over the administration of which he had differences with the Federal War Department. He resigned his office on January 11th, giving no reason. Until January 19th, Lieut.-Gov. Charles A. Smith held the office as Governor, and on that date Richard I. Manning, elected in 1914, took office. On January 22nd, Governor Manning reversed the order disbanding the militia. The General Assembly in 1915 devoted much time to the prohibition question. In addition to the drafting of a State-wide law for a submission to referendum the Assembly enacted a statute which makes effective in the State the provisions of the Webb-Kenyon Federal Act, prohibiting the shipment of liquor from wet to dry territory. The statute also forbids the shipment of more than one gallon of alcoholic liquors to any one person in the State during any one month. State-wide prohibition was adopted by a large majority. The law went into effect on Jan. 1, 1916.

STATE GOVERNMENT. Governor, Richard I. Manning; Lieutenant-Governor, Andrew J. Bethea; Secretary of State, R. M. McCown; Attorney-General, Thos. H. Peeples; Treasurer, S. T. Carter; Comptroller, C. W. Sawyer; Superintendent of Education, John E. Swearingen; Adjutant-General, W. W. Moore; Commissioner of Agriculture, E. J. Watson; Commissioner of Insurance, F. H. McMaster—all Democrats.

JUDICIARY. Supreme Court: Chief Justice, Eugene B. Gary; Justices, D. E. Hydrick, R. C. Watts, Thos. B. Fraser, and Geo. W. Gage; Clerk, U. R. Brooks.

STATE LEGISLATURE:

	Senate	House	Joint Ballot
Democrats	44	124	168

SOUTH DAKOTA. POPULATION. The estimated population of the State on July 31, 1915, was 680,046. The population in 1910 was 583,888.

AGRICULTURE. The acreage, population, and value of the principal crops estimated by the

United States Department of Agriculture, in 1914-15, were as follows:

		<i>Acres</i>	<i>Prod. Bu.</i>	<i>Value</i>
Corn	1915	3,250,000	94,250,000	\$46,182,000
	1914	3,000,000	78,000,000	89,000,000
Wheat	1915	3,725,000	63,762,000	54,835,000
	1914	3,469,000	31,566,000	29,672,000
Oats	1915	1,725,000	72,450,000	20,286,000
	1914	1,606,000	44,165,000	16,783,000
Rye	1915	90,000	1,755,000	1,834,000
	1914	60,000	1,020,000	796,000
Barley	1915	750,000	24,000,000	11,040,000
	1914	850,000	19,550,000	9,775,000
Potatoes	1915	68,000	7,820,000	2,737,000
	1914	68,000	5,670,000	2,665,000
Hay	1915	610,000	a 1,220,000	6,466,000
	1914	500,000	850,000	4,845,000

a Tons.

LIVE STOCK. The United States Department of Agriculture estimated that on Jan. 1, 1916, and Jan. 1, 1915, sheep numbered 604,000 and 636,000, valued at \$3,141,000 and \$2,862,000; swine numbered 1,314,000 and 1,395,000, valued at \$13,271,000 and \$13,145,000; mules numbered 15,000 and 14,000, valued at \$1,635,000 and \$1,484,000; milch cows numbered 485,000 and 453,000, valued at \$28,615,000 and \$26,954,000; other cattle numbered 1,064,000 and 967,000, valued at \$40,858,000 and \$38,196,000; horses numbered 759,000 and 759,000, valued at \$70,587,000 and \$67,551,000. The amount of wool produced in 1915 and 1914 was 3,547,000 and 3,500,000 pounds.

MINERAL PRODUCTION. The production of gold in 1914 was 354,758 fine ounces, valued at \$7,333,508. In 1913 it amounted to 354,071 fine ounces, valued at \$7,319,294. Practically all of the gold produced came from the Homestake Mine. The silver production amounted to 176,642 fine ounces, valued at \$97,683, compared with 172,736 fine ounces, valued at \$104,312 in 1913. The value of the total mineral production in 1914 was \$7,861,601, compared with \$7,909,059 in 1913.

TRANSPORTATION. The total railway mileage operated in the State in 1914 was 4240. The roads having the longest mileage were the Chicago, Milwaukee, and St. Paul, 1794, and the Chicago Northwestern, 1063.

EDUCATION. The school population, according to statistics furnished by the State Superintendent of Education on May 17, 1915, was 175,092. According to this report the total enrollment in classes below high schools in 1914 was 139,068, of which 87,206 were in the rural districts. The total number of teachers employed was 7161, of whom 5348 were in the rural districts. Of the latter, 4552 were females and 796 males. The average monthly salary for females in the rural districts was \$51.08, and in the independent districts, \$63.41. For males the average salary in the rural districts was \$56.55, and in the independent districts, \$108.35. The enrollment in the high schools was 10,085, of which 1680 were in the rural districts. The total expenditures for school purposes were \$5,413,063.

FINANCE. The report of the State treasurer for the fiscal year ending June 30, 1914, shows cash on hand July 1, 1913, of \$925,135. The receipts for the year were \$4,337,928, and the disbursements, \$4,444,939, leaving cash on hand June 30, 1914, of \$818,123.

CHARITIES AND CORRECTIONS. The charitable and correctional institutions include the School for the Deaf and Dumb, School for the Blind,

Northern Hospital for the Insane, Custer Sanatorium, and the State School for Deaf Mutes at Sioux Falls.

POLITICS AND GOVERNMENT. On January 30th the Senate passed a bill, already adopted in the House, abolishing the death penalty. On March 3rd the House adopted the Senate resolution submitting the woman suffrage amendment to the voters in November, 1916.

On November 20th, the Supreme Court handed down a decision which declared the so-called "blue sky" law unconstitutional. This law was first enacted in 1913, but in an effort to eliminate certain objectional features it was repealed in 1915, and a new law was enacted to replace it. The latter statute was the one that was held invalid. The case involved two dealers who were arrested for selling stocks without first obtaining permission of the State officials, as required by law.

STATE GOVERNMENT. Governor, Frank M. Byrne; Lieutenant-Governor, Peter Norbeck; Secretary of State, Frank M. Rood; Treasurer, A. W. Ewert; Superintendent of Education, Charles H. Lugg; Attorney-General, C. C. Caldwell; Adjutant-General, W. A. Morris; State Auditor, J. E. Handlin; Commissioner of Agriculture, C. N. McIlvaine; Commissioner of Insurance, M. H. O'Brien—all Republicans.

JUDICIARY. Supreme Court: Presiding Judge, James H. McCoy; Justices, Charles S. Whiting, John Howard Gates, Samuel C. Polley, and E. G. Smith; Clerk, E. F. Swartz.

STATE LEGISLATURE:

	<i>Senate</i>	<i>House</i>	<i>Joint Ballot</i>
Republicans	34	84	118
Democrats	11	19	30
Republican majority ..	23	65	88

SOUTH DAKOTA, UNIVERSITY OF. A State institution for higher education, founded at Vermillion, S. D., in 1882. The total enrollment in all departments in 1915 was 515. The faculty numbered 56. During the year the departments of journalism, fine arts, and commerce and finance were created, and additional professors were appointed in the departments of sociology and education. The institution is supported almost entirely by legislative appropriations. The annual income in 1915 was \$145,500. The library contained about 30,000 volumes. The president is Robert L. Slagle, A.M., Ph.D.

SOUTH DAKOTA STATE COLLEGE OF AGRICULTURE AND MECHANIC ARTS. A State institution, founded at Brookings, S. D., in 1883. The college offers courses in animal husbandry, dairy husbandry, agronomy, horticulture, civil, mechanical, and electrical engineering, pharmacy, general science, home economics, secretarial work, music, agriculture, dairy science, and traction engineering. It has also a preparatory department. In 1915 there was established a department of agricultural extension, consisting of instruction work outside the college. This is carried on in several ways—county agent work, short courses, boys' and girls' club work, home economics, and dairying. Thirty trained teachers were employed in these courses in 1916. There were enrolled in all departments of the college in the year 1915-16, 1097, of whom 710 were men and 387 women. The faculty numbered 72. The endowment is

estimated at \$1,500,000, and the annual income is about \$285,000. The college is supported chiefly by legislative appropriations, and in 1915 a special appropriation of \$75,000 was made for a second women's dormitory and for a dining hall for men and women. This building was under construction in 1916. The library contained about 18,800 bound volumes, and 6000 pamphlets. The president in 1916 was Elwood C. Persh.

SOUTHERN NIGERIA. See NIGERIA.

SOUTHERN RHODESIA. See RHODESIA.

SOUTHERN SOCIOLOGICAL CONGRESS.

See SOCIOLOGY.

SOUTH GEORGIA. Island dependencies of the Falkland Islands (q.v.).

SOUTH ORKNEY ISLANDS. A dependency of the Falkland Islands (q.v.).

SOUTH POLE. See POLAR RESEARCH, *Antarctic*.

SOY BEAN. See DIABETES.

SPAIN. A constitutional monarchy in southwestern Europe, occupying the greater part of the Iberian Peninsula. It is separated from France by the Pyrenees. The capital is Madrid.

AREA AND POPULATION. The country, anciently made up of 14 kingdoms, is now separated into 49 provinces. These provinces, with their area in square kilometers, and population, as calculated Dec. 31, 1913, compared with the population according to the census of Dec. 31, 1910, are as follows:

	Sq. km.	Pop. 1910	Pop. 1913
Alava	3,045	97,181	97,692
Albacete	14,863	264,698	273,880
Alicante	5,660	497,416	499,691
Almería	8,704	380,388	384,287
Ávila	7,882	208,796	212,207
Badajoz	21,894	593,206	619,518
Baleares	5,014	326,023	329,881
Barcelona	7,691	1,141,733	1,168,242
Burgos	14,196	846,697	849,423
Cáceres	19,863	397,785	415,286
Cádiz	7,842	470,092	475,121
Canarias	7,273	444,016	469,768
Castellón	6,465	322,218	322,587
Ciudad-Real	19,608	379,674	399,985
Córdoba	13,727	498,782	505,649
Coruña, La	7,903	676,708	683,448
Cuenca	17,193	269,634	275,876
Gerona	5,865	319,679	325,531
Granada	12,768	522,605	533,638
Guadalajara	12,113	209,352	212,009
Guipúzcoa	1,885	226,684	236,689
Huelva	10,138	309,888	326,878
Huesca	15,149	248,257	248,848
Jaén	13,480	526,713	546,458
León	15,377	395,480	395,951
Lérida	12,151	284,971	288,189
Logroño	5,041	188,235	187,888
Lugo	9,881	479,965	482,682
Madrid	7,989	878,641	901,767
Málaga	7,389	523,412	529,242
Murcia	11,537	615,105	621,823
Navarra	10,506	312,235	312,449
Orense	6,979	411,560	416,677
Oviedo	10,895	685,131	701,081
Palencia	8,484	196,031	197,795
Pontevedra	4,391	495,356	504,684
Salamanca	12,510	334,377	337,580
Santander	5,460	302,956	312,282
Segovia	6,827	167,747	170,599
Sevilla	14,062	597,031	608,303
Soria	10,318	158,354	158,649
Tarragona	6,490	388,485	397,830
Teruel	14,818	255,491	257,319
Toledo	15,257	413,217	427,298
Valencia	10,751	884,298	905,531
Valladolid	7,569	284,478	287,288
Vizcaya	2,165	849,923	868,586
Zamora	10,615	273,045	278,194
Zaragoza	17,424	448,995	460,557
Total	504,517*	19,950,817	20,355,986

* 194,794 square miles.

The foregoing table includes the Balearic and Canary islands (respectively the provinces of Baleares and Canarias); it also includes Ceuta (population, 23,907), which is a part of Cádiz province. At the 1910 census, males numbered 9,724,906, and females 10,270,540. If the Spanish possessions on the north and west coast of Africa be included, Spain had in 1910 19,995,446 inhabitants. The census figures given above represent the *de facto* population; the *de jure* population corresponding to the total 19,950,817 was 20,319,377, and that corresponding to 19,995,446 was 20,364,392. Including the possessions in the Gulf of Guinea, the *de facto* population in 1910 was 20,027,412 (9,742,947 males, 10,284,465 females), and the *de jure* population 20,393,687 (10,062,971 males, 10,330,716 females).

Provisional figures for 1914 report 132,451 marriages, 609,188 births, 451,098 deaths, 129,576 emigrants, 192,067 immigrants. The number of marriages in 1912 was 142,897, births 637,901, and deaths 426,269. Emigrants in 1912, 194,443—147,640 to Argentina, 29,386 to Cuba, and 9641 to Brazil. Some of the principal cities, with their communal population, census of 1910, are: Madrid, 599,807; Barcelona, 587,411; Valencia, 233,348; Seville, 158,287; Málaga, 136,365; Murcia, 125,057; Saragossa, 113,729; Cartagena, 102,542; Bilbao, 93,536; Granada, 80,511; Lorcá, 70,807; Valladolid, 71,066; Palma (Baleares), 67,544; Cádiz, 67,174; Córdoba, 66,831; Santa Cruz de Tenerife, 63,004; Santander, 65,046; Las Palmas (Canarias), 62,886; Jerez de la Frontera, 62,628; Alicante, 55,300; Gijón, 55,248; Oviedo, 53,269; San Sebastián, 49,008.

Nearly two-thirds of the population are unable to read or write. Many private schools are under clerical control, though recent legislation has made attempts to provide for some control of their curricula, condition, and faculties. Public schools are maintained by local taxation. Secondary instruction is provided by one high school in each province, but the curricula are imperfect; special schools are few. There are 10 universities.

PRODUCTION. Of the total area, 79.65 per cent is returned as "productive" (33.8 per cent as under sown crops and gardens, 3.7 under vineyards, 1.6 under olives, 19.7 under natural pasture, and 20.8 under orchards). As a matter of fact, according to the report of the minister of the interior, although the soil is fertile and conditions favorable to agriculture, 60 per cent of the land is uncultivated, and 38 per cent is entirely without irrigation. The vine is grown in every province, sherry and tent wines coming from the vicinity of Jerez de la Frontera and Cádiz, malaga and alicante from the southeast. In the table below are given areas under main crops and yield for two years, with yield per hectare in 1913-14:

	Hectares		1000 Qs.		Qs.
	1913-14	1914-15	1913-14	1914-15	Ha.
Wheat	3,917,765	4,024,362	81,594	89,238	8.1
Rye	763,646	751,767	6,083	7,281	8.0
Barley	1,377,552	1,652,864	15,735	18,391	11.4
Oats	527,617	558,144	4,582	5,275	8.6
Corn	460,217	.....	7,702	.....	16.7
Rice	89,200	.....	2,475	.....	68.2
Flax	24,608	1,050	.....	.....	.....
Beets	85,000	.....	.....	.....	.....
Vines	1,241,125	1,282,502	16,167	10,112	.....
Potatoes	278,500	.....	20,862	.....	74.9
Olives	1,453,000	.....	2,077	.....	.....

* Yield in seed. † For sugar. ‡ Yield in hectolitres of must.

Live stock, Dec. 31, 1911: 546,035 horses, 904,725 mules and hinnies, 836,741 donkeys, 2,541,112 cattle, 15,725,882 sheep, 3,369,624 goats, 2,472,416 swine, 3398 camels. Live stock in 1912: 525,853 horses, 928,920 mules, 829,410 asses, 2,561,894 cattle, 15,829,954 sheep, 3,116,226 goats, 2,571,359 swine.

Sericulture is carried on in Valencia, Murcia, and other provinces. In the spring of 1912, 7500 hectograms of silkworm eggs were placed for hatching, and the production of cocoons was estimated at 1,175,000 kilograms, as compared with 1,250,000 kilograms obtained in 1911. Cotton goods, paper, cork, and glass are manufactured.

Rich mineral deposits exist, but almost the only efficient exploitation is by foreign enterprise employing foreign capital. The mining industries in 1911 employed 112,142 male and 5361 female workers, of whom 15,821 were boys, and 1706 girls under 18 years of age. Amount of copper output 1911, 3,284,184 metric tons, valued at 35,654,223 pesetas; iron, 8,773,691 tons and 47,599,172 pesetas; coal, 3,454,394 and 47,690,363; lead, 163,843 and 27,620,683; argentiferous lead, 156,569 and 24,575,689; mercury, 19,940 and 3,527,003; zinc, 162,140 and 6,742,493; anthracite, 209,227 and 3,321,092; lignite, 252,051 and 3,057,237, etc. In 1909, 3,622,573 metric tons of coal (valued at 47,345,231 pesetas) were produced; 8,786,020 of iron (45,503,256); 2,955,253 of copper (35,407,181); 161,496 of argentiferous lead (30,619,076); 137,049 of lead (18,780,025); 163,521 of zinc (7,388,293); 37,397 of mercury (5,082,425); 265,019 of lignite (3,269,094); 21,749 of sulphur (149,127).

Value of fisheries products, between 40,000,000 and 60,000,000 pesetas; of the output of the sardine factories, about 16,000,000 pesetas.

COMMERCE. By royal decree dated Aug. 3, 1914, the export of wheat, rye, barley, maize, rice, and other cereals and all kinds of flour was prohibited. By royal decree dated October 20th, the export of rice to the amount of 30,000 tons was authorized. By royal decree dated December 16th, the prohibition on export was maintained only for wheat and wheat flour. A royal decree of December 19th fixed an export duty for barley, oats, and rice. The export of maize and linseed was prohibited by royal decree of March 13, 1915, but barley may be freely exported in consequence of a decree of May 20th. The export of raw cotton has been forbidden since May 31, 1915, by a decree of that date. The special trade is given in pesetas below, for three successive years (par value of the peseta, 19.295 cents):

	1910	1913	1914
Imports	1,000,086,564	1,414,947,889	1,110,868,919
Exports	970,519,855	1,195,007,719	948,090,558

Imports for consumption and exports of domestic produce follow, with values in thousands of pesetas, for 1914: foodstuffs, 251,519 imports, 355,822 exports; cotton and cotton manufactures, 138,203 and 47,241; drugs and chemical products, 113,339 and 34,820; machinery, 128,276 and 4073; minerals and ceramics, 114,546 and 114,056; animals and animal products, 47,647 and 37,211; metals and their manufactures, 54,954 and 120,841; timber, 56,220 and 62,796; silk and its manufactures, 21,590 and 4938;

wool and woolens, 12,692 and 59,789; other textiles, 19,641 and 4226; paper, 12,300 and 11,922; various, 23,413 and 10,032; special imports, 23,464; packing, 4744; precious metals, 28,417 and 13,177. The principal countries of origin and destination follow, 1914 special trade, values in thousands of pesetas:

	Imps.	Exps.		Imps.	Exps.
U. K.	219,496	232,753	Argentina..	88,242	41,337
France	184,258	250,845	Switz.	19,705	8,616
U. S.	147,497	68,664	Italy	21,866	50,652
Germany..	108,124	42,407	Norway ...	17,461	8,487
Br. Ind..	55,806	790	Neth'ds ...	15,165	40,308
Russia ..	47,222	6,540	Phil. Is...	18,225	6,848
Portugal .	26,286	21,209	Sweden ...	10,017	2,690
Belgium .	27,688	22,016	Brasil	12,897	2,511

SHIPPING. Vessels entered at the ports in 1911, 20,766, of 20,900,576 tons (11,358, of 7,948,303 tons, Spanish); cleared, 18,157, of 20,338,480 tons (9069, of 7,475,300 tons, Spanish). Total coasting vessels entered, 57,668, of 15,347,923 tons. Vessels entered at the ports in 1912, 21,711, of 22,668,000 tons, and in 1913, 22,296, of 25,403,827 tons; cleared, 1912, 19,051, of 22,045,000 tons; in 1914, 18,915, of 22,229,159 tons, entered, and 16,482, of 19,265,265 tons, cleared. Coasting vessels entered in 1914, 57,459, of 16,304,644 tons, and 1913, 19,185 vessels, of 23,942,643 tons.

Merchant marine, Jan. 1, 1912, 582 steamers, of 750,081 tons, and 301 sail, of 44,325; Jan. 1, 1913, 596 steamers, of 761,281 tons, and 301 sail, of 44,325; Jan. 1, 1915, 640 steamers, of 875,609 tons, and 217 sail, of 29,118.

COMMUNICATIONS. In 1912 (January) there were in operation 14,805 kilometers of railway and 42,553 of telegraph lines (wires, 93,432); Jan. 1, 1914, railways, 15,350 kilometers; telegraphs, 44,546 (wires, 97,426). Post offices (1913), 7135.

FINANCE. The unit of value is the peseta, par value, 19.295 cents. Revenue and expenditure for three years in pesetas are given below.

	1912	1913	1914
Revenue	1,161,964,749	1,225,815,068	1,343,781,639
Expend.	1,145,190,173	1,196,153,848	1,437,350,660

The details of the 1915 budget are given below in thousands of pesetas:

Revenue	1000 Ps.	Expenditure	1000 Ps.
Direct taxes on land, trade, government salaries, registration, etc.	490,108	Public debt	422,520
Indirect taxes, customs, excise, etc.	431,800	Pensions	47,585
Tobacco monopoly, lottery, mint, and minor sundries	818,370	State	928
Revenue from lands	81,771	Worship	41,689
Public treasury	81,771	Justice	19,864
		War	164,641
		Marine	68,784
		Interior	94,152
		Instruction	74,356
		Public works ..	184,321
		Finance	18,584
		Collecting	150,991
		Colonies	1,900
		Morocco*	124,802
		Other .....	.....
Total	1,280,536	Total	1,465,044

* Campaign.

The public debt stood, Jan. 1, 1912, at 9,407,724,977 pesetas; Jan. 1, 1913, 9,941,918,985 pesetas; Jan. 1, 1914, 9,973,485,962 pesetas; Jan. 1, 1915, 9,410,884,684 pesetas.

NAVY. A new programme was under consideration which would include 3 new dreadnoughts.

2 scouts, 8 destroyers, besides torpedo boats and submarines. The navy, exclusive of non-effective vessels, is composed of 1 second-class battleship (9890 tons), 3 first-class protected cruisers (25,133), 1 second-class (5871), and 2 third-class (4083), 4 torpedo-boat destroyers (1845), 1 torpedo boat (127) of the first and 4 (284) of the second-class, 8 first-class gunboats (6925), and 8 second- and third-class (3202)—in all, 32 vessels, of 57,360 aggregate tons. Building are 4 gunboats, of 800 tons, and 3 destroyers, of 370—all at Cartagena; and 24 torpedo boats for coastal service, also 1 cruiser (*Jaime I*) of 15,700 tons.

GOVERNMENT. The constitution vests the executive power in the King, acting through a responsible cabinet of ministers appointed by himself. The Cortes, conjointly with the King, exercise the legislative authority; the Cortes consist of a Senate (360 members, partly hereditary, partly appointive, and partly elective) and a Congress of Deputies (431 members, elective). Reigning sovereign, Alfonso XIII. Heir-apparent, Prince Alfonso, born May 10, 1907.

HISTORY

THE QUESTION OF NEUTRALITY. While the Spanish government maintained a policy of strict neutrality in the war, the rival political factions within Spain engaged in bitter controversies with regard to the attitude which should be adopted towards the belligerents and the immediate measures which should be enacted for the protection of Spanish interests. The Liberals, the Republicans, and the Socialists manifested strong sympathy with the Allies, maintaining that the cause of liberty and progress was represented by Republican France, with its anti-clerical and radical traditions, as opposed to militaristic Germany and Roman Catholic Austria. Outspoken attacks on German policy and on pro-German agitators were published by influential journals like *El Liberal*, *El Imparcial*, and the *Diario universal*. On the other hand, a considerable group of clericals contended that the Third French Republic was in the control of a clique of corrupt politicians, whose chief object was to persecute the Church. The very fact that the anti-clerical factions in Spain were the warmest supporters of the Allies caused the clericals to insist all the more strenuously upon strict neutrality; a few clericals even assumed a pro-German attitude. The cause of the Central Powers was advocated also by army officers, who admired the German military system, and by Conservative monarchists, who disliked the Liberal and Republican tendencies of Great Britain and France. Furthermore, a number of journals receiving, or suspected of receiving, German financial support, conducted a vigorous pro-German propaganda in Spain. *A. B. C.*, a popular penny illustrated daily, was probably the most conspicuous of these pro-German organs. Against the pro-German agitation, and against the alleged expenditure of German gold for the purpose of influencing Spanish public opinion, the *Diario*, the *Epoca*, and other Spanish journals indignantly protested.

CRITICISM OF THE DATO GOVERNMENT. The division of Spanish opinion with regard to the war was not so frankly expressed in the Cortes as in the press. Instead of openly attacking Premier Dato's foreign policy, the opponents of

the Conservative government directed their criticism against the government's economic policy, and demanded that more energetic measures be taken for the protection of Spain's economic interests. Thus Senator Navarro Reverter interpellated the government, February 1st, regarding the effect of the European war on Spain, and demanded "that the government shall explain its intentions and inform the public of the measures by which the consequences of the European conflict, and especially the economic consequences, are to be counteracted." The government, Señor Reverter declared, must lose no time in assuring the economic interests of the nation. In reply to the interpellation, Señor Dato asserted that the government would not neglect its duty in respect of the nation's material prosperity; at the same time he laid great stress on the fact that he had conducted the foreign policy of the country with singular success, with the result that Spain, while strictly neutral, remained on good terms with all the belligerents. The prime minister ended his speech with an eloquent appeal for unanimous support—"I count on the collaboration of the nation's representatives: in union will be our strength."

NAVAL INCREASES. One of the chief concerns of the Dato cabinet was the augmentation of Spain's naval and military forces, with the object of better assuring the country's "national interests." In February the Cortes were asked to authorize an expenditure of more than \$55,000,000 upon a six-year naval programme. Four cruisers, 6 destroyers, 28 submarines, 3 gunboats, and 18 coast defense vessels were to be added to the navy; submarine mines were to be purchased; and repair docks and naval works were to be constructed at Ferrol, Cádiz, and Cartagena.

FINANCIAL DIFFICULTIES. The burden of the naval estimates, added to the financial difficulties already imposed upon Spain by the war, necessitated the issuance of treasury bonds to cover the deficit in the budget. An issue of \$20,000,000 was authorized in February. Early in June a much larger loan, amounting to \$150,000,000, was issued. The investing public, however, whether for political or for economic reasons, refused to take up more than a tenth of the \$150,000,000 loan. Interpreting the failure of the loan as a popular vote of "no confidence," the Dato cabinet resigned, June 22nd; but two days later it was announced that at the King's desire the cabinet had decided to remain in office.

FALL OF THE CONSERVATIVE CABINET. In December a more serious crisis was provoked by Count Romanones, leader of the Liberal Opposition, during the debate that followed the introduction of an ambitious military programme by the minister of war. In concert with the Reformists, Republicans, Jaimists, and other factions opposed to the Conservative government, Count Romanones submitted a resolution, signed by himself and by Señor Alvarez, Señor Mella, Señor Lerroux, and Señor Salvatella, expressing the unwillingness of the Chamber of Deputies to consider the government's military projects, unless at the same time financial measures were laid before the Chamber to cover the expense of the army increases and to ameliorate the country's economic situation. In reply to the speech in which Count Romanones urged the acceptance of his motion, Señor Dato insisted that the mili-

tary reforms be voted before financial questions were brought into consideration. He defended his government on the merits of its patient and successful diplomacy, not the least achievement of which had been the exaction of an indemnity of 240,000 pesetas for the killing of seven Spanish citizens at Liège. He boasted that as a result of the government's efforts to promote the economic welfare of the country, the peseta had recently risen in value. Señor Dato absolutely refused to comply with the request of the Opposition that economic measures be considered before or in conjunction with the military projects which the government considered to be of vital and urgent importance. As Count Romanones and the Opposition groups stubbornly persisted in their attitude of hostility towards the ministry, even after their motion had been defeated by the Conservative majority, Señor Dato offered his resignation. In accordance with the established parliamentary practice, King Alfonso immediately conferred with the leaders of the various parties, as well as the presiding officers of both chambers of the Cortes. The president of the Chamber of Deputies and the president of the Senate advised the retention of Señor Dato as premier; even Count Romanones signified his readiness to support the Conservative cabinet, provided that economic and financial questions be given precedence over military reforms; but Señor Dato refused to reconsider his resignation. He promised to accept a minor place in a new Conservative cabinet, if Señor Besada, the president of the Chamber of Deputies, could be prevailed upon to assume the responsibilities of premier. Señor Besada, however, was unwilling to undertake the task of constructing a new cabinet, since the Opposition parties were hostile and the Conservatives themselves were badly divided. Finally, the king invited the Liberal leader, Count Romanones, to form a cabinet.

THE LIBERAL CABINET. Count Romanones readily accepted the invitation to form a Liberal ministry, and succeeded in constructing his cabinet as follows: Premier, Count Alvaro de Romanones; foreign affairs, Señor Villanueva; justice, Señor Barroso; interior, the Duke of Alba; finances, Señor Urgaiz; war, General Luque; public works, Señor Quero; commerce, Señor Amos Salvador; public education, Señor Burell; marine, Vice-Admiral Arias Miranda. It will be noted that Vice-Admiral Miranda, who had been minister of marine in the Dato cabinet, and had drawn up the Conservative government's programme of national defense, remained in charge of naval affairs under Count Romanones. This circumstance, taken in conjunction with the new prime minister's declaration that "since right does not exist without might, we will pursue the plan of military reorganization and national defense," made it clear from the outset that the Conservatives' military projects, although they might be postponed, would not be discarded. The first concern of the new government, Count Romanones announced, would be to solve the problems which had arisen relative to the supply and price of food, the labor situation, the commercial and financial crisis, and other economic matters. In its effect upon the foreign policy of Spain, the installation of the Romanones cabinet was generally interpreted as a victory for the parties favorable to the Allies, since Count Romanones's strong personal inclinations toward the Allies were well known.

Count Romanones officially proclaimed his intention, however, of continuing the policy of his predecessor, and declared, "we are convinced that, whatever happens, and whoever wins, Spain must remain strictly neutral." In carrying out his policies, Count Romanones at first announced that he would attempt to rely on the benevolence of the Conservatives, inasmuch as the Liberals were the minority party in the Cortes; but a fortnight later he abandoned the attempt to govern without a majority, and persuaded the King to issue a decree dissolving the Cortes. Recent victories in municipal elections, in which Romanones Liberals, Prieto Democratic Liberals, and Alvarez Reformists had successfully combined their forces, gave Count Romanones reason to expect that in the forthcoming elections his government would be returned with a comfortable majority. Prior to the formation of the Romanones cabinet, Señor Ugarte (public works) and Señor Collantes (education) resigned their portfolios and were succeeded, respectively, by Señor Espada and Señor Andrade, October 25th.

SPALDING, ALBERT GOODWILL. American merchant and baseball official, died Sept. 10, 1915. He was born in Byron, Ill., in 1850, and was educated at the public schools. At 17 years of age he obtained much local prominence as an amateur baseball player, and in 1871 joined the Boston club as a pitcher. This club won the championship for four successive years. Mr. Spalding afterwards managed and became the owner of the National Association Chicago Club. He was the organizer of the National League, and was one of the best known baseball players of his day. With his brother and brother-in-law he started in 1876 the now well known sporting-goods firm of A. G. Spalding & Bros.

SPANISH LITERATURE. The official statistics for Spanish literature in 1915 have not yet appeared. If, however, we may judge by what figures are at present available, it would seem as though, despite the great war, the amount of the output was almost up to par, as compared with recent years, for the *Bibliografía Española*, which is the organ of the *Asociación de la Librería de España*, shows a total of 1535 books produced by the trade up to December 1st. At the same date in 1914 the total was 1584. It is impossible, however, at this writing, to tell what proportion of books published belong to literature proper. The European war interfered with the importation of Spanish books, and this interference limited somewhat the scope of the present article, which was forced to be content with the consideration of books at hand, belonging chiefly to literary criticism in one form or another.

LITERARY CRITICISM. The *Bulletin Hispanique* (which is prepared at Bordeaux) published its four quarterly numbers on time. The *Revue Hispanique* (which is the organ of The Hispanic Society of America) has long been very much behind in its publication. For years past it published four large numbers (two good volumes) per year. Late in 1914 it completed volumes 28 and 29 for 1913, and announced that, beginning with the subscription for 1914, there would be six numbers and three volumes per year, without increasing the subscription price. During 1915 The Hispanic Society issued 10 numbers, thus completing all of the year 1914 and two of the three volumes for 1915. To men-

tion only a few critical studies, we have: Peseux-Richard, *Un romancier espagnol: Jacinto Octavio Picón*; Alonso Cortés, *Gómez Pereira y Luis de Mercado: Datos para su biografía*; Foulché-Delbos, *Les œuvres attribuées à Mendoza; Cantares populares de Castilla* (Collection of 4874, made by Alonso Cortés); Rennert, *Bibliography of the Dramatic Works of Lope de Vega Carpio, based upon the Catalogue of John Rutter Cholley*; and *Cancionero espiritual* (Valladolid, 1549), reprinted by Aguilera Morales. In 1914 criticism had come into a more formal recognition in Spain by the establishment of both the *Boletín de la Real Academia Española* (five numbers per year) and the *Revista de Filología Española* (a quarterly, of which Ramón Menéndez Pidal is editor). Both publications are distinct additions to our resources, and during the past year have produced many valuable articles. There have also been some scholarly studies in book form: J. P. Wickersham Crawford, *The Spanish Pastoral Drama*; and A. Paz y Mélia, *El Cronista Alonso de Palencia* (published by The Hispanic Society of America). This latter study completes the author's annotated translation (5 volumes, in the *Colección de Escritores Castellanos* of the *Décadas* of Palencia. Cejador y Frauca has published two volumes of his *Historia de la lengua y literatura castellana* (bringing it through the Epoch of Charles V). Other studies of importance are: Cortacero y Velasco, *Cervantes y el Evangelio*; Juliá, *El castellano puede escribirse como se habla*; G. Michaelis, *Die sogennanten "comédies espagnoles" des Thomas Corneille*; Rodríguez García, *De la Avellanada*; and Carré Aldao, *Influencias de la literatura gallega en la castellana*. Of scholarly reprints (both critical editions and those intended for scholarly popularization) the following must be mentioned: Cervantes, *Obras Completas: Persiles y Sigismundo* (2 volumes, by Schevill and Bonilla y San Martín); *Guerras Civiles de Granada* (a reprint of the *princeps* edition of the first and second parts, by Paula Blanchard-Demouge); Menéndez y Pelayo, *Orígenes de la Novela* (this fourth volume completes the work in question and is vol. xxi of the *Nueva Biblioteca de Autores Españoles*); and Foulché-Delbos has published the second volume of his *Cancionero Castellano del Siglo XV* (vol. xxii, *Nueva Biblioteca de Autores Españoles*). *Clásicos Castellanos* also continued their series of scholarly productions for the general public: Fr. Antonio de Guevara, *Menosprecio de corte y alabanza de aldea* (by Martínez de Burgos); and Juan Eusebio Nieremberg, *Epistolario* (by Alonso Cortés). Of Menéndez y Pelayo's *Obras Completas*, vol. v has been published this year.

THE SPANISH ROYAL ACADEMY. Too late to be mentioned in our article for 1914, occurred the deaths of two very prominent academicians: the Duque de Rivas (who continued the tradition of his house by being in his turn a distinguished statesman, diplomat, and poet), and the Conde de Casa Valencia (who was also a brilliant statesman, diplomat, and historian). By the dates of their respective elections they were, in the order mentioned, the senior members of the Academy. The celebrated Jesuit Padre Luis Coloma (author of *Pequeñeces*, a book whose appearance in 1890 caused an upheaval in Madrid society) died last June. Of the members-elect the following, having read their entrance discourses, have formally taken their

seats: Juan Navarro Reverter (*Renacimiento de la poesía provenzal en España*); the novelist Ricardo León (*La lengua clásica y el espíritu moderno*); the poet and archaeologist Juan Menéndez Pidal (*Vida y obras de Luis Zapata*); and the dramatist Pedro de Novo y Colson (*Los cantores del mar*). Volume xi of the *Memorias* of the Academy contains the second part of the thitherto unedited papers of the late Cristóbal Pérez Pastor. The Academy has continued its *Biblioteca Selecta de Clásicos Españoles* with the following volumes: *Obras de don Juan Ignacio González del Castillo* (by Leopoldo Cano); and a new edition of *Calila y Dimna* (by José Alemany). The Academy, and His Majesty Alfonso XIII, awarded the Fastenrath Prize to Concha Espina de Serna for her novel *La Esfinge maragata*, mentioned in our account for 1914; and the Academy awarded an *accessit* to a work entitled *Estudio crítico, biográfico, y bibliográfico del bachiller Diego Sánchez de Badajoz*, which proved to have been written by José López Prudencio.

For philological works, see PHILOLOGY, MODERN.

SPANUTIUS, FREDERICK W. American chemist, died June 20, 1915. He was born in New Haven, Conn., in 1868, graduating from Illinois University. For many years he was on the faculty of the Sheffield Scientific School. He was afterwards for a time assistant chemist and mineralogist in the Pennsylvania State College, and held similar positions in the Ohio State University and Lehigh University. He was also chemist and officer in several chemical manufacturing companies, and was the owner of a large factory in Hastings, N. Y., known as the Pan Chemical Company. He wrote many scientific articles for newspapers and magazines.

SPECTROSCOPY. See ASTRONOMY.

SPECTRUM. See PHYSICS.

SPIRITS. See LIQUORS.

SPIRITUALISTS' ASSOCIATION, THE NATIONAL. An association incorporated in 1893 for the union of local Spiritualist societies of the United States into an organization for mutual help and coöperation in charitable, educational, religious, and missionary activity relating to the objects and phenomena of spiritualism. It had in 1915, 1000 working local societies; 22 State associations; 400 other local societies; 500 public meetings not organized as societies; 32 camp meeting associations; 200 churches and temples; 1 academy; a membership of about 600,000 confessed believers in spiritualism; between 1,500,000 and 2,000,000 attendants at spiritualistic meetings and public services; 1500 public mediums; 500 ordained ministers; and church, temple, and camp meeting property valued at \$6,000,000. Its headquarters are in Washington, D. C. Its chief officers are: George B. Warne, president; George W. Kates, secretary; Cassius L. Stevens, treasurer. The next annual convention will be held in St. Paul, Minn., in October, 1916.

SPLENETIC FEVER. See VETERINARY MEDICINE.

SPORTS. See such titles as ATHLETICS, TRACK AND FIELD; BASEBALL; BOXING; FOOTBALL; ROWING; SWIMMING; YACHTING, etc.

SPRAGUE, WILLIAM. An American public official, former Governor of Rhode Island, and United States Senator from that State, died Sept. 11, 1915. He was born in Cranston,

Rhode Island, in 1831, a member of a family famous in the history of the State. After attending private schools in Rhode Island, and at Tarrytown, N. Y., he entered the cotton-print business, which was founded by his uncle, and on the death of that relative became the head of a new firm, the A. and W. Sprague Company. In 1860, through the union of the conservative wing of the Republican, with the Democratic, party, he was elected Governor of Rhode Island, and was reelected in 1861 and 1862. Fort Sumter was fired on the second day after his election. Through his activity, Rhode Island was one of the first to respond to the President's call for troops, and Governor Sprague, with a Rhode Island regiment, fought at the battle of Bull Run. He served through the peninsular campaign, and was commissioned brigadier-general of volunteers. In 1862, he was elected to the United States Senate, and was reelected in 1868. During his first senatorial term he met Katherine Chase, daughter of Chief Justice Chase, and in 1863 they were married. Miss Chase was known as one of the most beautiful and talented women of her period. The wedding was reported to have cost \$200,000, and is said to have been the most elaborate ever held in the United States up to that time. In the meantime, General Sprague had become, through the success of his business, very wealthy. His firm, however, had a rival in the firm of Brown and Ives. Disputes between them became bitter, and not without wide political and financial effects. In the panic of 1873, the financial structure erected by General Sprague crashed. The firm had expanded its business so rapidly that it was unable to meet its obligations. The liabilities amounted to \$14,000,000, and the nominal assets to \$16,000,000. The failure was caused by complicated litigation in which eventually General Sprague lost the whole of his property with the exception of his summer home at Narragansett, which for many years he defended with armed guards. Mrs. Sprague's property became involved in the trouble, and Roscoe Conkling and other men of importance assisted her in retaining her father's estate, Edgewood, in Washington. In 1883 Mrs. Sprague obtained a divorce. In 1902 the famous house at Narragansett was destroyed by fire. General Sprague spent the remainder of his life in Paris. He gave the greater part of his home in that city as a convalescent hospital at the outbreak of the war in Europe.

SPRINGS, MINERAL. See **HYDROTHERAPY**; and **SARATOGA SPRINGS**.

SQUASH. The old English game is rapidly gaining favor in the United States, judging from the interest shown in it during 1915. Eric S. Winston, of the Harvard Club, New York City, jumped into prominence by his decisive victory over Evelyn du Pont Irving in the national championship tourney of the National Squash Tennis Association. Dr. Alfred Stillman, 2nd, champion in 1914, and George Whitney, from whom he won the title, failed to enter the tournament. In professional squash, Stephen J. Feron, who had held the championship title for 10 years, went down to defeat at the hands of Walter A. Kinsella of the Harvard Club.

STAFF, KARL ALBERT. Swedish statesman, died Oct. 4, 1915. He was a minister without portfolio in the coalition cabinet in 1905, but soon afterwards resigned, and formed a cabinet

in which he was premier and minister of justice. In 1906 he was succeeded by Mr. Lindeman, but in 1911 again formed a cabinet and held office until February, 1914. At this time the cabinet resigned because of differences between King Gustav and the members of the cabinet as to the right of the King to make political speeches without having first secured the approval of the cabinet.

STAGE SOCIETY. See **DRAMA**, **AMERICAN** AND **ENGLISH**.

STAMPS. **POSTAGE STAMPS.** Owing to the frequent issues of new postage stamps, there is constant improvement in their artistic appearance. For many years it has been the fashion to issue commemorative stamps in honor of some distinguished individual or of some great event. In the United States the centennial of the signing of the Declaration of Independence, the 400th anniversary of the discovery of America by Columbus, the centenary of Lincoln's birth, and the completion of the Panama Canal were so celebrated, while in Europe, Austria issued a complete series of artistic stamps in 1908 in honor of the 60 years' reign of Francis Joseph II, on which were portraits of his imperial ancestors, and in 1910 Russia issued a similar series commemorating the 300th anniversary of the founding of the Romanoff dynasty with portraits of the emperors, beginning with Peter the Great. The great war in Europe has been the occasion for the issuing of a series of postage stamps by Austria on which are shown various war scenes. These carry the values in figures at the bottom of the stamps with an additional charity tax value in the centre. In Canada, stamps bearing the words "war tax," engraved on the die, are used, the government requiring one cent extra postage for local letters, and two cents for foreign postage. See James H. Lyons, *The Commemorative Stamps of the World* (Boston, 1914).

CHARITY STAMPS. Of these there are principally two varieties, those issued officially, that is by the government itself, and those issued by various organizations, such as the Red Cross societies. The former need but little description. They present some view or design, often of a symbolical nature, indicating their purpose, and frequently, like the Russian issue of 1905, carry two values, one showing the postage value and the other postage and charity values, the excess over the postage value being turned over by the government to the charitable purpose. Others bear the portrait of the reigning sovereign, like the Belgian issue for 1915, and may be sold exclusively for charity, as the work of the Red Cross.

The origin of the private charity stamps is traceable to the United States, for it appears that as long ago as 1862 stamps were sold at the fair of the Sanitary Commission in Boston and elsewhere to raise funds for the wounded during the Civil War. At these fairs information was conveyed to the visitor that a letter for him was to be found at the post office and there he would receive a letter with a stamp affixed for which he paid the required postage. In 1892 Portugal took up the practice and issued the first private stamps for the Red Cross Society. Switzerland followed two years later, and since 1897 the custom has been almost universal. In 1904 the Swedish National Anti-Tuberculosis Association began the practice of issuing an annual stamp

and has since continued that method of raising funds for the suppression of the white plague. In the first year, 6,675,000 stamps were sold, netting for the association over \$24,000. In four years nearly \$100,000 was raised by this means. On the other hand, the official Rumanian charity postage stamps yielded over \$50,000 for a single series. Many of these stamps are exceedingly artistic, the designs being chosen by public competition, and in some the accepted sketch receives an honorarium. The Austrian charity stamp showed a side view of the head of the Empress Elizabeth in blue, and that of Germany the present Empress with her daughter, now Duchess of Brunswick. In 1905 Sweden presented the portrait of the aged King and Queen in commemoration of their golden wedding, and in 1907 Spain, in honor of the recent marriage of its King, showed his portrait and that of his Queen. In the United States the practice of issuing Christmas "seals," as they are called, was begun in 1907 by the Red Cross Society. These are issued each year in December, and bear the salutation of "Merry Christmas," and sometimes also "Happy New Year." In 1914, 55,000,000 seals were sold which, after deducting all expenses, left nearly \$500,000, which was expended in the fight against tuberculosis in the communities where the seals were sold. The series of six stamps, in several colors, issued by the British Red Cross in 1914 for the purpose of aiding in the care of the wounded, is an artistic set. Other stamps for special benevolent funds have been sold in England since the beginning of the great war.

Other charities besides the Red Cross have taken advantage of this means of raising money by small amounts. Thus in 1897, at the time of the celebration of the 60 years' reign of Queen Victoria, charity stamps for various amounts were issued in England for the Prince of Wales Hospital fund, and in New South Wales, a stamp in gold, blue, and red colors, valued at 2 shillings and 6 pence, commemorating the "Diamond Jubilee," was issued for the "Consumptives' Home" of the colony. In 1911, in the United States, the working men were urged to purchase seals, the proceeds from which were expended in defraying the cost of the defense of the McNamara brothers, who were charged with dynamiting the building of the Los Angeles (Cal.) *Times* in October, 1910. In 1912, the centenary of the birth of Charles Dickens, an attempt was made to secure funds to alleviate the wants of certain of his descendants by issuing an engraved stamp bearing his portrait, which the purchaser was requested to insert in his volumes of the great novelist. The sum of \$40,000 was raised by this method.

POSTER STAMPS. The origin of these attractive little advertising messengers is claimed by various German cities, and in that country they have had a more extensive use than elsewhere. They probably originated by the reduction in miniature of some large poster, and in 1896 the exposition held in Budapest so used them. Similar poster stamps advertising the Olympic games held in Athens, Greece, in 1906, and one of "Carnival Week" in Manila, in 1908, suggest the larger posters. For a time their use seems to have been confined to advertising events and so specimens in brilliant colors were sent out by the Brussels, Belgium, Exposition in 1897, a practice that has extended down to the Panama-

Pacific Exposition, held in 1915, for which books containing 36 views in colors of the exposition were to be had. Various congresses, such as the Eucharistic Congress, held in Montreal, Canada, in 1910, and the "Play Congress," held annually in different cities in the United States, have had their poster stamps. They have been used to announce "Home Coming" weeks, and also extensively by women in advocating the extension of the suffrage. Many of them serve to advertise cities and resorts, as those from Rome, Italy, with views of the Coliseum and other buildings, or those from Geneva, Switzerland, with views of Mt. Blanc. In the United States these are more crude and consist of slogans, such as "Come to the New Durango Country, Yea." As they grew in favor with the public their uses multiplied almost indefinitely. There were portrait posters of Taft, Bryan, and Clark, when candidates for the presidency of the United States, and from Austria came one celebrating an anniversary of Johann Strauss, the music composer. The purely advertising poster stamps need not be discussed, although some are exceedingly interesting and instructive. One series, issued by an express company in the United States, shows the modes of transportation from a clipper ship to a motor vehicle. Then there are varieties with mottoes simply as "Thinking of you," which are used to paste on the back of envelopes.

In Germany children's books are published with a package of poster stamps, and the story must be told by inserting the stamps in their proper places. Sunday schools reward the attendance and good behavior of their scholars by giving them poster stamps depicting religious events, which are to be inserted in an album, and an empty space is an offense which is not easy to overcome. During the six years preceding Jan. 1, 1915, 35,000,000 of these stamps were printed and circulated in England alone.

STATE BANKS. The report of the Comptroller of the Currency showed that on June 23, 1915, there were 14,598 State banks in the United States. They had total resources of \$4,399,602,000, including loans, discounts, and overdrafts, \$2,908,024,000; bonds and securities, \$420,475,000; and cash on hand, \$242,754,000. There were 1664 loan and trust companies with total resources of \$5,873,120,000, including loans, discounts, and overdrafts, \$3,048,668,000; bonds and securities, \$1,349,613,000; and cash on hand, \$287,957,000. There were 1036 private banks with total resources of \$177,665,000, including loans, discounts, and overdrafts, \$15,312,000; bonds and securities, \$15,312,000; and cash on hand, \$6,451,000. State banks had total liabilities of \$4,399,602,000, including capital stock paid in, \$503,985,000; surplus, \$221,081,000; undivided profits, \$97,220,000; and individual deposits, \$3,277,772,000. Loan and trust companies had total liabilities of \$5,873,120,000, including capital stock paid in, \$476,806,000, surplus, \$450,675,000; undivided profits, \$126,718,000; and individual deposits, \$4,204,596,000. Private banks had total liabilities of \$177,665,000, including capital stock, \$20,547,000; surplus, \$8,442,000; undivided profits, \$4,037,000; and individual deposits, \$134,410,000. See **BANKS AND BANKING** for relation of State banks and Federal Reserve System.

STATISTICAL ASSOCIATION, AMERICAN. The 77th annual meeting of this body was held

in Washington, D. C., December 28-30, in connection with the American Historical Association, the American Economic Association, the American Sociological Society, and other similar organizations. Following the president's address by Prof. E. Dana Durand of the University of Minnesota, a session was devoted to the general topic of "Standardization and Government Efficiency." In a subsequent session papers were presented on "Statistics of Imports and Exports," by Frank R. Rutter of the Bureau of Foreign and Domestic Commerce; on "Proportion of Population Engaged in Agriculture in the Several Countries," by Eugene Merritt, of the Department of Agriculture; and there was general discussion of a report of a committee on "Standards for Graphic Forms of Presentation." A session on vital statistics included the following papers: "The Nature and Significance of the Changes in the Birth and Death Rates in Recent Years," by Walter F. Willcox of Cornell University; "The Influence of Vital Statistics Upon the Conservation of Human Life," by W. S. Rankin, secretary of the State Board of Health of North Carolina; "The Relation of Sickness Reports to Health Administration," by John W. Trask, assistant surgeon general, United States Public Health Service; "Vital Statistics in Relation to Life Insurance," by Louis I. Dublin, statistician, Metropolitan Life Insurance Company; and "Statistics of Infant Mortality," by Lewis Meriam, Bureau of Municipal Research, New York City. The final sessions included the following papers: "The Federal Registration Service of the United States: Its Development, Problems, and Defects," by Cressy L. Wilbur, director, Division of Vital Statistics, New York State Department of Health; "Vital Statistics in the States and Cities of the United States," by Wilmer R. Batt, State Registrar of Vital Statistics of Pennsylvania, Charles V. Chaplin, Superintendent of Public Health of Rhode Island, and William H. Guilfooy, Registrar of Records of New York City; "Informe sobre el desarrollo de la estadística demográfica de El Salvador," by Dr. Pedro S. Fonseca of Salvador; and "The Accuracy and Completeness of Compiled Vital Statistics in the United States," by John S. Fulton, secretary of State Board of Health, Maryland. See SOCIOLOGY.

STATISTICS. See VITAL STATISTICS.

STEAM ENGINES. Notable among the large engines installed in 1915 was a duplex incline cross-compound hoisting engine built by the Nordberg Manufacturing Company for the Home State Mining Company. The hoist has a capacity of 12,000 pounds net ore per trip, from a depth of 3200 feet, or a total estimated pull on the rope of 42,900 pounds. This engine has two high pressure cylinders, each 28 inches in diameter, two low pressure cylinders, each 52 inches in diameter, and a stroke of 42 inches. It is said to be the largest hoisting engine of the kind in the world.

STEAMSHIPS. See SHIPBUILDING.

STEAM TURBINES. During 1915 the large electric light and other public service plants continued to use and to order steam turbines of ever increasing capacity. The 35,000 kilowatt unit of the Philadelphia Electric Company (see DYNAMO ELECTRIC MACHINERY) was placed in service during the year. A 40,000 kilowatt turbine was ordered by the Duquesne Light Company of Pittsburgh, while the Detroit Edison

Company, in whose various stations important developments and modern practice were to be expected, was considering providing 45,000 kilowatt units at its Delray station. It was thought likely that a 50,000 kilowatt unit might be built, as there appeared to be no engineering difficulties in the way of such a machine. Increased economy was being obtained from these large machines, and even from the smaller machines, especially in the water rates, and a greater speed was being obtained even in the larger units. Steam turbines were being used more and more with reduction gearing, and direct current units were being coupled to high-speed turbines in this way, these gears making a flexible arrangement permit speed from both machines most suitable to their efficient operation. Gear reduction was also employed extensively during the year with small generators, and seemed to work efficiently. One of the developments of the year was the application of the steam turbine to rolling mills. This occurred at the Carpenter Steel Company's plant at Reading, Pa., where a low pressure De Laval nine stage turbine, operating at 5000 revolutions per minute was employed to drive two stands of 18-inch 3-high rolling mills. This was made possible by reducing the speed to first 600 and then to 100 revolutions per minute, through the use of a helical involute gear. This arrangement was notable as it was the first instance of the use in the United States of a low pressure turbine in a rolling mill, and only the second instance in the world.

STEEL. See CHEMISTRY, INDUSTRIAL; IRON AND STEEL; and METALLURGY.

STEFANSSON, VILHJAHLME. See POLAR RESEARCH, Arctic.

STEIN, SIR AUBEL. See EXPLORATION, Asia.

STERILIZATION. See EUGENICS.

STILLMAN, THOMAS BLISS. American chemical engineer, died Aug. 10, 1915. He was born in Plainfield, N. J., in 1852, and graduated from Rutgers College in 1873. He took graduate courses in Rutgers and at the Stevens Institute of Technology, in the latter of which institutions he received the degree of Ph.D. He was appointed professor of analytical chemistry at Stevens Institute in 1886, holding this chair until 1903, when he was appointed a professor of engineering and chemistry. In 1909 he was retired upon the Carnegie Pension Fund. At the time of his death he was city chemist of Jersey City and Bayonne, and chemist of the medical milk commission of Newark. He was a member of many scientific societies both in the United States and in foreign countries. His published writings include *Engineering and Chemistry* (1897). He wrote also many monographs and papers in American and foreign technical journals.

STOCK EXCHANGE. See FINANCIAL REVIEW.

STOCK RAISING AND MEAT PRODUCTION. THE LIVE STOCK SUPPLY. The total value of all live stock on farms and ranges in the United States on Jan. 1, 1915, was estimated at \$5,969,253,000, an increase of \$78,024,000, or 1.3 per cent, over the valuation of a year previously. Of this total valuation nearly one-half was for work animals and the other half for food animals. The prices of meat animals, hogs, cattle, sheep, and chickens to producers on April 15th averaged about \$6.59 per 100 pounds, which

compares with \$7.40 in 1914, \$7.35 in 1913, \$6.30 in 1912, \$5.80 in 1911, and \$7.74 in 1910. Beef cattle and calves were lower than one and two years previously, but higher than three years before; hogs were lower, while sheep and lambs were higher than in any of the preceding three years.

A material decrease in imports of beef into the United States was a logical result of the European war. During the first seven months of the year 1915 beef imports were but 75,353,535 pounds, valued at \$6,823,155, against 176,582,128 pounds, with a valuation of \$15,373,348 during the same period of 1914. Imports of mutton during the seven-month period were 7,811,131 pounds, against 14,142,188 pounds in 1914, and of pork, 1,724,343 pounds, against 8,146,093 in 1914. The total fresh-meat imports during the period dropped from 198,870,409 pounds in 1914 to 84,889,007 pounds. Imports of other meats and dairy products also were materially curtailed by the war. Mexico was the heaviest contributor of stock cattle to the United States. The first seven months' contribution of Mexico in 1915 was 194,650 head, against 359,619 in 1914, and that of Canada, 57,936 head, against 55,113 last year.

Exports of beef and hog products were on an enormous scale. During the eight months ending with August, 1915, exports of fresh beef aggregated 188,787,794 pounds, against 4,727,909 pounds in 1914. Exports of canned beef during the same period were 59,802,715 pounds, against 4,824,240 the previous year. Bacon exports for the eight months were 326,163,620 pounds, against 112,333,387 in 1914, and lard exports, 315,518,440 pounds, against 280,511,877 in the previous year. Although the exports of meats and dairy products rose from \$146,000,000 to \$220,000,000, or about one-half, they did not prevent a decline in prices to producers of cattle and hogs.

The supply of live stock at the six principal cattle markets in the Mississippi Valley during 1915 consisted of approximately 7,500,000 cattle, 16,500,000 hogs, and 9,700,000 sheep, representing an increase of 550,000 cattle, 1,650,000 hogs, and a decrease of 2,000,000 sheep as compared with 1914. The live stock trade was seriously handicapped by the spread of foot-and-mouth disease (see VETERINARY MEDICINE), and an advance in the cost of cotton-seed cake contributed to a heavy liquidation during the latter months of 1915. The West had more cattle than a year previously, but Eastern territory was in need of replenishment.

A significant change was taking place in the management of cattle in the Panhandle of Texas. This had been one of the chief cattle-raising sections of the country. In the past it had been customary to ship out the cattle to be fed in the Middle-Western and corn-belt States, but the possibilities of profit in feeding these cattle at home had been demonstrated and ranchmen were no longer contenting themselves with the raising of cattle, but were feeding them for the market.

An important factor in connection with the country's meat supply was the public grazing domain. There were grazed last year under pay permits 1,724,000 cattle and horses, and 7,300,000 sheep and goats. Several hundred thousand head of milch and work animals were grazed free of charge, and more than 3,500,000 head of stock crossed the forests, feeding en route, also

free of charge. The number of animals sustained in proportion to the area of the forests was 50 per cent greater than it was 10 years previously. It is probable that 100,000,000 pounds of beef and mutton are sold each year from herds and flocks occupying the ranges.

The work of eradicating the cattle tick in the South was continued, and its progress was making possible a fuller development of the cattle industry in that section. Areas amounting in the aggregate to 12,313 square miles, situated in the States of Alabama, Arkansas, Louisiana, Mississippi, North Carolina, and Virginia, were freed from the tick quarantine on Dec. 1, 1915. Wherever areas were released from quarantine the cattle industry received a marked impetus. The Northern markets for beef cattle and feeders were open to Southern farmers and the Southern markets to Northern breeders.

Among the most promising agencies for increasing the meat supply of the country, and particularly that of the individual farm, were the pig clubs. Originally started in the South, the clubs extended into many Northern and Western States, and during the year they had a membership of about 9000 boys and girls. In 11 counties in Georgia where pig-club work was conducted, 11,000,000 pounds of cured pork were produced during 1914. Over 2000 registered hogs, of which 75 per cent were sows, were owned by pig-club members. Poultry clubs likewise have received much attention. These have been organized in 98 counties in six Southern States, with a total membership of 4000. The clubs are becoming centres for the development of community breeding of poultry.

Efforts at coöperation were made by the farmers of the Middle West to facilitate the distribution and marketing of their live stock products. Their ability to work together in this way was demonstrated in the remarkable spread of the live stock shippers' association movement. Farmers' coöperative meat packing companies were organized in a number of communities in Wisconsin, Iowa, and Minnesota, and more than a score of others were reported to be contemplated. The Department of Agriculture was conducting a study of existing markets for and systems of marketing live stock, meats, and animal products, for the purpose of suggesting ways and means by which they could be improved and their cost reduced. Certain localities devised systems of marketing, such as the direct selling of home-prepared meat products, especially farm-cured hams, bacon, and sausage; municipal slaughtering plants; live stock shippers' associations; and the shipment of meat by parcel post. These efforts were to be encouraged and extended into localities, particularly the South and West, where methods of distribution were still in their elementary stage. In an effort to improve the breeding stock of the South, coöperative cattle sales were conducted by the Bureau of Animal Industry, assisted by the Shorthorn and Aberdeen-Angus breed associations. The farmers of these States were induced to extend their cattle feeding operations and to adopt the most approved methods of feeding.

FOREIGN TRADE IN MEAT AND LIVE STOCK. The cattle business generally in South American countries is in excellent condition. Unusually large operations by United States packers produced competition which was partially responsible for the good business which the cattle

growers were enjoying. The new Armour frigorifico at La Plata was to be the largest in South America and was to have a capacity for the daily slaughter of 2000 cattle, 4500 sheep, and 2000 pigs. Most of the meat prepared in this establishment was to be shipped to the United States, although a portion was also to go to British ports.

Since the war began frozen beef, which had been growing unpopular, had to a large extent displaced the chilled article, owing to the ease with which it could be transported. During the first half of 1915 Argentina exported 1,280,426 quarters of frozen and 655,600 quarters of chilled beef, against 328,880 and 2,124,670 quarters, respectively, the first half of 1914. Of Argentine beef exports during the first half of the year 1915, 1,136,523 quarters of frozen and 544,858 quarters of chilled went to Great Britain, and 140,677 of frozen and 110,742 of chilled to the United States, the rest being consigned to France, Italy, and Holland.

There was a marked decline in mutton production in South America within recent years, only 481,195 carcasses of lamb and 249,856 carcasses of mutton having been exported during the first half of the year 1915, against 1,171,705 of lamb and 501,043 of mutton during the same period of 1911, when floodtide was reached.

Australian exports of meat products showed a marked increase. The total exports of mutton from July 1, 1914, to June 30, 1915, amounted to over 2,000,000 carcasses, compared with 1,600,000 carcasses during the previous year. England and Europe were by far the best customers. The shipments of beef for the same period, however, showed a decrease. An act, known as the Meat Supply Act, had been passed in Australia at the request and instigation of the British government, by which the state government was the sole buyer of all exportable meat in New South Wales. All meat was to be bought and paid for by the state government on behalf of the British government.

The frozen meat industry of New Zealand was receiving much attention at this time, and much was being done to improve the herds and flocks of this dominion, as well as to develop the grazing lands of the country. The increase of sheep in New Zealand was estimated at 100 per cent.

HORSES. While the demand by the European countries for horses from the United States was large, there was apparently no immediate danger of an American shortage. It was estimated by the Department of Agriculture that on Jan. 1, 1915, there were 24,000,000 horses in the United States. During the 15 months previous to Oct. 1, 1915, approximately 405,000 horses and 97,000 mules were exported from the United States. These exports, however, were not sufficient to prevent a decline of about 4.6 per cent in the average price. The kind of horses which were purchased for the most part were of a grade which the United States could dispense with to the advantage of its horse-breeding industry.

WOOL. Sheep declined in numbers in the Eastern farming States, but increased on the ranges. Prices for wool were good, and with a liberal feed supply on the ranges there was an effort toward reviving or increasing sheep raising on the ranges. A conference of sheep and wool specialists was held in San Francisco in August, 1915. The chief topic under consideration was the so-called Australian system of shearing and class-

ifying wool, and the possibilities of its adoption in this country. The general sentiment was in favor of the improved method. In these countries the wool is examined and classified when it is sheared, only one grade being put into a bale, and the bales of the same lot are uniform. The fleeces are carefully skirted and each fleece is of even, serviceable quality. An organization of Wyoming and Utah sheepmen was the first to put a model plant in operation in America and to demonstrate the value of the Australian system. To inaugurate in the United States the Australian system of selling by auction would require, it is estimated, a coöperative movement by growers representing 20 per cent of the country's clip. The exports of wool from Australasia from July, 1914, to May 31, 1915, showed a net decrease of 71,719 bales, or approximately 160,000,000 pounds. The United States received 58,000,000 pounds of Australasian wool during the same period. There was a marked growth of these direct American purchases of wool from the two island dominions which have more sheep than any other countries of the world.

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STOESSEL, ANATOLE MIKHAILOVITCH. Russian soldier, died Jan. 17, 1915. He was born in 1848, and entered the cadet corps in 1858 at the age of 10. He graduated from the Pavoff Military Academy as an officer in 1866; served with the Bulgarian militia during the Russo-Turkish War in 1877-78; and after that war he traveled throughout the entire Empire. He held various commands in different parts of Siberia, where, in 1899, he was raised to the rank of general. In the Russo-Japanese War he commanded the fortress of Fort Port Arthur. After a siege of many months, when he claimed that his ammunition was exhausted and his men without food, he surrendered the fortress to General Nogai. Charges brought against him by other officers in high command at Port Arthur resulted in a court martial, which in 1908 condemned him to death for treason. The court martial found that he had surrendered the fortress before it was necessary and that he had shown cowardice in the defense. His sentence was commuted to 10 years' imprisonment, internment, and dismissal from the army. After spending 15 months in the fortress of St. Peter and St. Paul, he was released by order of the Czar.

STONE INDUSTRY. The total value of the stone produced and sold in the United States in

1914 was \$77,412,292, compared with \$83,732,995 in 1913, a decrease of \$6,302,703, or 7.55 per cent. The decrease was due to general financial depression. All parts of the stone industry were not equally affected. There was an increase in sand stone and marble, but a decrease in granite, trap rock, and limestone. Building stone decreased in value from \$18,097,219 in 1913, to \$17,796,552 in 1914. Monumental stone, paving stone, and curb stone also decreased. There were 14 States that reported an increase, and 33 a decrease. Pennsylvania holds first rank among stone producing States, with Vermont second. Other States which produce large quantities are New York, Ohio, California, Indiana, and Massachusetts.

STORAGE BATTERIES. See ELECTRICAL INDUSTRIES, *Electric Batteries*.

STORY, JOHN PATTEN. American soldier, died March 25, 1914. He was born in Waukesha in 1841, and graduated from the United States Military Academy in 1865, in which year he was appointed first lieutenant in the 16th infantry, later being transferred to the artillery. He rose through various grades until he became colonel in 1902. Two years later, he was appointed brigadier-general and chief of artillery. He was retired in 1905, after 40 years' service. From 1888-98 he was instructor in the artillery school; for several years inspector of the artillery; and commander of the artillery school from 1902 to 1904. He was a member of the general staff of the United States army, and of the joint army and navy board, from 1902-04. He was a member also of other important boards.

STORY, THOMAS WALDO. American sculptor, died Oct. 24, 1915. He was born in Rome, Italy, in 1835, the son of William Wetmore Story, a distinguished sculptor, and the brother of Julian Story, a well-known painter. He early gained fame in New York City and elsewhere. The first statue unveiled in the British House of Commons was of his making, as were also a bust of the late Lord Randolph Churchill, and the bronze doors of the library of J. P. Morgan. For many years he occupied the Barberini Palace, which was left to him by his father. He married Bessie Abbott, an American opera singer.

STRAITS SETTLEMENTS. A British crown colony in Malaysia, composed as follows:

	Sq. m.	Pop. 1911	Pop. 1914	Cap.
Singapore	807	311,985	339,861	Singapore
Penang	571	278,008	287,985	George Town
Malacca	720	124,081	184,225	Malacca
Total	1,598	714,069	761,521	Singapore

The settlement of Singapore comprises the island of Singapore (217 square miles), Christmas Island (62 square miles), Labuan Island (28 square miles), and the Cocos or Keeling Islands, the largest of which is five miles by one-fourth of a mile. The area of the Cocos is not included in the foregoing table. The settlement of Penang comprises the Island of Penang (108 square miles), Province Wellesley (280 square miles), on the Malay Peninsula, and the Dindings Territory (183 square miles). Malacca is on the mainland of the peninsula. The population of Singapore Island is gathered chiefly in the city of Singapore, one of the principal ports of the East; in 1901 the inhabitants of the city numbered 193,089. The colony produces tapioca, rice, and rubber (chiefly in Malacca and Province

Wellesley), and sugar (in Province Wellesley). Coal is mined in Labuan. Trade and financial statistics are given below in Straits Settlements dollars; shipping in tons entered and cleared.

	1908	1910	1913
Imports	316,395,939	364,470,658	484,152,621
Exports	278,818,124	324,189,786	388,929,705
Revenue	8,969,015	9,886,828	12,897,747
Expenditure	9,937,624	7,532,242	10,468,618
Shipping	21,750,245	23,429,495	27,124,789

From Jan. 1, 1912, the railways of the Straits Settlements had been under the management of the Federated Malay States government.

STREET CLEANING. The use of machines for sweeping and flushing is increasing. A few cities are beginning to keep systematic records of the areas of each kind of pavement cleaned, and the cost of cleaning by different methods, but as a whole American cities are woefully deficient in street cleaning records. Such records are needed to throw light on the relative advantages of different methods. Emergency snow removal forces were mustered out with success to cope with several snowfalls during the year. In both New York and Philadelphia time and money were saved by dumping snow into the sewers and letting the moving liquid convey the snow to the water fronts.

STREET RAILWAYS. See MUNICIPAL OWNERSHIP.

STREETT, DAVID. American physician and educator, died July 30, 1915. He was born in Hartford County, Md., in 1855; educated in Bethlehem Academy, Maryland; studied medicine at the Physicians' and Surgeons' College, Baltimore; and was from 1888-89 resident physician at the Maternity Hospital in that city. He was physician in chief at the Medical General Hospital from 1885 until his death. In 1885 he was appointed professor of the principles and practice of medicine at Baltimore Medical College, and he was dean of that college from 1888 till his death. He was an officer on the boards of several hospitals and medical schools, and was the author of many papers and addresses on medical subjects.

STRIKES AND LOCKOUTS. According to *Bradstreet's* the high tide of strikes in 1915 was reached in September, with a smaller maximum in July; the months of January, February, May, and June were comparatively peaceful. While strikes were numerous, they were usually of short duration, and in the first 10 months involved not more than 185,000 persons. This number was greater than in 1914 or 1909, but was exceeded in every other year since 1903. In 1903 the total number of strikers was 650,000; in 1906 and 1910 it was 550,000. A special feature of the industrial situation in 1915 was the large amount of business due to war orders. This had its disturbing effect on the machine trades in particular and also less notably on others. Workmen believed that unusual profits were accruing to employers; that this golden opportunity would be of short duration; and that they were entitled to a portion of these fortuitous gains. This accounted for a considerable number of strikes in Connecticut, New York, Pennsylvania, Massachusetts, and other metal-trades districts for an eight-hour day and higher wages. The results were general reductions in the length of the working day and increases in pay. In a score of large plants these conces-

sions were made before strikes were actually ordered.

Another alleged cause of strikes in munitions plants was the activity of agents of the German and Austrian governments. The exact extent of this influence could not be estimated, but officials connected with the Austrian Embassy admitted activities in behalf of their laboring fellow countrymen. At various times President Gompers of the American Federation of Labor charged that agents of foreign governments were fomenting strikes, not merely in the munitions plants but among longshoremen and seamen. For further facts on this point see LABOR.

In 1914, for the first time, an attempt was made by the United States Bureau of Labor Statistics to compile a record of strikes and lockouts entirely from printed sources, newspapers, labor journals, trade-union periodicals, manufacturers' and trade papers, and other sources. By this method the Bureau secured records of 979 strikes and 101 lockouts that began or were pending during 1914. The table in which strikes and lockouts are classified by occupations and by States shows that of 1080 strikes and lockouts, 275 were in the building trades, 129 in the metal trades, 78 in the clothing industry, and 54 in textile work. The number of strikes reported north of the Ohio and east of the Mississippi was 742; south of the Ohio and east of the Mississippi, 90; west of the Mississippi, 248; 66 per cent occurred in 10 States and 46 per cent in 5 States, the leading States being New York, 148, Pennsylvania, 104, Massachusetts, 90, Ohio, 80, and Illinois, 75. The principal causes appear to be wages, hours of labor, working conditions, and recognition of the union. Lockouts occurred frequently to prevent organization or to force an open shop. The duration of only 228 strikes was reported, and of this number 93, or 41 per cent, lasted one month or over, and 165, or 72 per cent, lasted over one week. Twelve were reported as lasting over two years, and six lasting five years or over. One strike against a paving brick company of Illinois lasted 12 years, while one of photo-engravers in New York City lasted 16 years.

According to data compiled by the United States Bureau of Labor Statistics from newspapers, the number of strikes and lockouts in the United States from Jan. 1, 1915, to November 1st, was 1126; 646 occurring from January 1st to July 1st and 468 from July 1st to November 1st, or 1014 for the ten months. During the first half of 1915 the 12 industries in which the number of strikes exceeded 10 and the number of strikes in each are as follows: building trades, 155; metal trades, 124; clothing industries, 40; baking industry, 44; textile industry, 36; mining industry, 31; transportation, 23; lumber, 22; teamsters, 16; brewery, 13; glassworking, 11; theatrical stage employees, 11; making 536 in all or 81 per cent of the entire number. The number of strikes during July, August, September, and October was comparatively large, due to some extent to the method by which they were called. In an unusually large proportion of the cases, however, the strikes were of short duration. Ordinarily a trade in a given locality makes demands on all the shops in its jurisdiction collectively, and orders one strike on all shops refusing to accede to the demands. But in several trades, especially in the machine industries, during these four months, the practice was

to make demands on individual shops one after the other and to order strikes in such cases as seemed advisable.

COLORADO COAL STRIKE. This strike was started Sept. 23, 1913, after efforts on the part of the Governor and others to prevent it. It was one of the most serious labor difficulties that have developed in the United States within recent years, amounting almost to a civil war, involving the Colorado Fuel and Iron Company, the largest coal company in Colorado, which mines one-third of all the coal produced in that State. The miners at the outset desired an increase of wages, better working conditions, pay for extra work, the right to trade where they pleased, and recognition of the union. The real issue ultimately became the recognition of the labor organizations. The militia was sent to settle the trouble, but their actions were reported as lawless and their conduct toward the inhabitants as unruly. The strike lasted until December, 1914. A final report was rendered in the investigation of the case by a subcommittee of the House Committee on Mines. The committee stated that from the evidence, each side was undoubtedly ready to battle. Political conditions in the mining regions were found to be bad, and the manner of selecting juries was contrary to law. The companies were in supreme command in the mining villages on account of their extensive use of imported workers, and their control of the land and stores. The report severely criticised various persons connected with the management of the companies and suggested a more reasonable attitude on their part toward employees, or, as an alternative, stringent Federal interference and control with possible government ownership. The incapacity of the Federal government to deal with conditions within a State under existing constitutional law, except as a matter either of voluntary arbitration on the part of those concerned, or of direct military control on the part of the government itself, for the purpose of repressing violence and protecting the interest of the public as a whole, was made evident by the report. It was equally clear that there are States in which existing local authorities are not competent to cope with strong combinations either of capital or labor. The conclusion was reached that "by gradual and sure development the coal business of the country is being conducted on a large scale, and by frequent consolidations is largely being carried on by large companies. Next to the business of transportation, the fuel business of the country touches the people and their business in an intimate and important way. If these strike troubles continue to break forth, it will be plainly necessary to consider whether some method of regulation shall not be adopted with reference to the business as carried on in interstate commerce as is now done with the business of transportation." In the hearings before the United States Commission of Industrial Relations, this strike was the subject of inquiry at a two-weeks' hearing in Denver, December, 1914. In January more than a week was spent upon it and in Washington, in May, another week was spent. A deduction made from the hearing was that the Rockefellers, owning 40 per cent of the stock of the companies, were responsible for what happened in that they could have prevented its happening. This momentous dispute showed clearly the evils of absentee capitalism,

its abuse of power, its disregard of responsibilities and of human rights, and its exploitation of labor.

THE LAWSON CASE. In the course of the above strike a deputy sheriff named John Nimmo was shot and killed at Ludlow in October, 1913. Mr. John R. Lawson of the International Executive Board of the United Mine Workers was charged with complicity in the murder. He was convicted on May 3rd, after the jury had deliberated for nearly two days. It was not claimed that Lawson had himself shot Nimmo, but that as a strike leader he was responsible for the event. The presiding judge, Granby Hillyer, sentenced him to life imprisonment. This conviction at once aroused utmost resentment among labor unionists throughout the country, funds being collected in many communities to carry on the defense. It was charged that Hillyer, who had just been appointed, had previously been employed by the coal companies, including the Rockefeller interests, and that he had been appointed expressly for the purpose of trying Lawson and numerous others whose cases were connected with the two years' strike. Shortly thereafter the Supreme Court barred Hillyer from sitting in any other of these cases. After three months in jail, Lawson was released on October 8th under \$35,000 bond. Meanwhile efforts were being made to have the Supreme Court review the case, this appeal being based mainly on the affidavit of one of the jurors. That the contest was bitter and determined was evidenced by the fact that on September 15th Attorney-General Farrar of Colorado caused the arrest of Lawson's attorneys on a charge of subornation of perjury.

MACHINISTS' STRIKES. During the four months beginning with July, 122 strikes and 6 lockouts of machinists were recorded, nearly one-fourth of all the strikes recorded during the four months period. The need for workers led many employers to make terms with the strikers as early as possible. The success of the first machinists' strike led others to make demands on their employers. Thus between July 1st and October 31st, 88 strikes occurred in Connecticut, a great centre of munitions manufacture, and many demands were adjusted without strikes; and in this State only 21 strikes occurred during 1914. A change to an eight-hour day was made in many firms without a strike. Firms in Ansonia, Conn., Bridgeport, Conn., Chicago, Ill., Plainfield, N. J., Raleigh, N. C., Springfield, Mass., Taunton, Mass., Toledo, Ohio, established an eight-hour day. Reductions of hours from 55, 58, and 60 hours a week to 54 hours were made by firms in Springfield, Mass., Taunton, Mass., Toledo, Ohio, and Derby, Conn.

BAYONNE. The Standard Oil Company of New Jersey employed 5000 men at its Bayonne refinery in one of the most profitable enterprises of the country. There was no machinery for collective bargaining or for any easy adjustment of grievances. This undemocratic régime was justified on the ground that none of the workmen could speak English. The rate of wages paid by the company was \$1.75 for 9 hours' work, the men working in shifts of 10 hours a day and 14 hours a night, changing shifts once a week, and getting 24 hours' rest each 7 days. The raising of wages by the International Nickel Company, an adjoining plant, caused dissatisfaction among the Standard Oil laborers. The men had their demands drawn up, including a 15 per

cent increase in wages and the discharge of a foreman regarded as insulting and arbitrary. The demands were refused by the company on the ground that it would not do business with the outside party who drew up the demands of the men. The strike developed quickly. Nearly a week after the strike began, the company demanded the police to clear the strikers from the streets adjoining the Standard Oil plant. Riots followed, and the company imported 500 armed guards. The strike spread to the plant of the Tidewater Oil Company. The killing of a boy by the policemen enraged the strikers and caused shooting on both sides, two strikers being killed and two fatally wounded. The measures of Sheriff Eugene F. Kinkead of Hudson County were responsible for breaking up the strike and inducing the men to return to work, after getting a promise from the company that the men's wages would be increased. At the same time he arrested 129 of the imported guards. The strike had been dangerous for a time, and the attacks of the mob on the property of the companies involved were fiercely determined, and it was due to the intervention of the sheriff that the militia was not called. The Standard and Tidewater Oil Companies increased wages by about 10 per cent and the unpopular foreman of the Standard Oil Company was transferred to another department.

THE EASTERN OHIO COAL STRIKE was settled in May, 1915, and involved 16,000 miners who held out for more than a year without committing a single act of violence. The union which conducted the strike was the United Mine Workers, the organization which was involved in the Colorado and West Virginia struggles. The struggle at its inception and until May, 1914, was a lockout, after which it became a strike. It ended in a compromise.

ROOSEVELT, N. J. Employees of the American Agricultural Chemical Company, the Consumer's Fertilizer Company, and Armour and Company went on strike Jan. 4, 1915, for a return to a \$2 a day wage scale which had been reduced to \$1.60 a day. The Consumer's Company met the demands of the workers, but the others held out. The strikers in trying to meet some strike breakers whom they heard were being brought in by the companies were fired upon by armed guards who were imported from New York. One was killed and 20 wounded. Reports agreed that the firing was unprovoked, and a situation similar to that of West Virginia and Colorado was presented. Twenty-two of the guards were arrested and held as slayers.

CHICAGO. Several notable strikes occurred in Chicago during the year. In April, building operations involving \$30,000,000 worth of contracts were tied up by a strike begun by 7000 lathers, painters, and sheet metal workers, and a somewhat greater number of carpenters. An increase in pay was demanded. It was estimated that fully 120,000 workmen were thrown out of employment. The announcement of the strike was immediately followed by a lockout against the strikers and their unions. The Governor requested the State Board of Arbitration to intervene. In June occurred a strike of 14,500 employees of the surface and elevated lines. It lasted 54 hours, during which much inconvenience was suffered, in spite of thousands of jitneys and other vehicles brought into use. There was no violence, but several hundred strike

breakers were moving toward the city when settlement was reached. Arbitration by the State Board failed, whereupon Mayor Thompson intervened. He succeeded in bringing about an agreement to be in force for two years, and providing substantial increases in wages. A great strike in the clothing industry was called on September 27th. It was estimated to involve 25,000 workers. Only two of the larger establishments escaped the strike, both of them having plans for adjusting differences. The strikers sought a 48-hour week for all workers and an introduction of the principle of collective bargaining. The employers refused to arbitrate on the ground that arbitration would result in the closed shop. They also maintained that the workers' union represented only 25 per cent of all their employees.

GREAT BRITAIN. From January to September, 1915, inclusive, there were 531 disputes involving 407,964 men, with an aggregate loss in working days of 2,613,100. For the same months in 1914 there were 858 disputes involving 427,401 men, with an aggregate loss of 9,949,900 days. The largest number of disputes for these months occurred in the engineering trades with 76; transportation, 63; coal mines, 56; shipbuilding, 41; textile, 55; building, 45; clothing, 31. From January to May there were 258 disputes, directly involving 103,265 persons, as over against 519 for the same period in 1914. Some of the causes during these months were increased wages, 185; trade unionism, 12; hours of labor, 6. The labor unrest caused anxiety on the part of the government. Mr. Lloyd George in dealing with the question of labor disputes in time of national danger declared that compulsory arbitration in war time was imperative, as it was "intolerable that the lives of Britons should be imperiled for a matter of a farthing an hour. There is a good thing to be said for, and there is a vast amount to be said against compulsory arbitration, but during the war the government ought to have the power to settle all these differences and the work should go on." He added that this war was to be fought in the workshops as well as on the battlefields and must be fought under war conditions. The workman must get his equivalent, but he must help to get as much out of the factories as possible, as the life of the nation depended upon it. Lord Kitchener made the announcement that men working long hours by day or night in shops show patriotism as well as those in the trenches, and that medals would be forthcoming at the end of the war for loyal and continuous service.

A committee was appointed to inquire into production in the engineering and shipbuilding establishments engaged in government work. The recommendation was made with a view to preventing loss of production by strikes and lockouts, that in the event of a failure of settlement by parties concerned, the matter should be referred to an impartial tribunal nominated by the government. The government concurred by making this committee the final tribunal. In the Munitions Bill strikes and lockouts were prohibited until the case is reported to the Board of Trade, who were empowered to take any steps they saw fit to promote settlement. These powers may be extended to any other than the munitions employments by royal proclamation. The strike among the engineers on the Clyde, involving about 10,000 men, as well as those of

the Liverpool carters and the London dockers, were excused by labor leaders on the ground that they were begun not with any idea of endangering the Empire or exposing the troops to risk, but under the misapprehension that a state of war was being made the excuse for further exploitation of the laboring man. Because of a feeling on the part of the men that certain individuals were reaping great gains from the situation while the laboring man was doing the hard work in a patriotic spirit, the government took over works adapted for the production of war material. Among other strikes in Great Britain which were comparatively important were those of the coalheavers at Liverpool, the Yorkshire miners, London tramwaymen, and Welsh coal miners. It was estimated there was a loss of £1,500,000 after seven days' stoppage in the Welsh coal strike, while the Liverpool Munitions Tribunal reported a loss of 1,500,000 hours in 20 weeks, causing a lack of proper ammunition at the front in some cases. In the strike of the tramwaymen of London, the London County Council demanded that every striker of military age enlist; this weakened considerably the position of the 10,000 men involved.

FRANCE. Fifteen strikes and three lockouts were reported to the French labor office from January to April, 1915, and 19 were reported for the months of May and June. Most of these strikes were for better wages, but some were for shorter hours and better conditions. The number of workers involved was remarkably small. The industries affected were: preparation of food, 4; weaving, 4; boots and shoes, 3; dock workers, 2; clothing, 2; and miscellaneous, 3. The average number of days lost was 5.61 days, the longest dispute lasting 54 days and the shortest, 1 day.

GERMANY. From the outbreak of the war to the end of March, 1915, according to the report of the Imperial Office of Labor Statistics, there occurred 52 labor disputes directly involving 4029 workmen; the total employed force in the establishments involved was 10,218. The average duration of the disputes was 4.77 days, as compared with 27.99 days, the average for the five-year period 1909-13. These strikes were not largely supported by the trade unions. The question of wages was involved in 43 of the labor disputes. Of the 52 disputes, 26 were settled by conciliation. As to results obtained, the strikes were wholly successful in 11 cases, involving 41 per cent of the men affected; and partially successful in 12 instances, involving 16.6 per cent of the employees affected. The total number of strikes during the second quarter of 1915 was 44, involving 72 establishments employing 11,780 workmen, of whom 2330 went on strike. The total number of days lost by strikers was 14,855. The two largest strikes were in a coal mine in Silesia and in a tool factory in Berlin, involving 1263 and 900 strikers respectively. Wage disputes were the cause of 35 strikes, while disputes involving hours of labor were responsible for 6 strikes. Of the 44 reported, 12 ended favorably to the strikers, and 10 with partial success, while 22 failed. In 14 strikes, third parties or trade organizations took an active part by supporting and subsidizing the strikers. Only one lockout was reported; it involved 1100 men.

STRIKE INSURANCE. The maintenance of strike insurance has become an important feature

of industrial developments in Germany and the Scandinavian countries. Employers claim that insurance by them against strikes is necessary to offset the advantages secured by trade unions through the payment of strike benefits. In Germany strike insurance is carried either by mutual organizations among employers or by individual establishments setting aside their own funds, or by insurance companies. The benefit secured takes the form either of claims for compensation, or of financial support upon the occurrence of a strike. In 1913 the 19 strike insurance mutual associations reported 34,333 members, employing 1,654,218 workers, and total annual wages of over \$300,000,000.

A mutual strike insurance association was formed by principal employers' associations of Sweden, Norway, and Denmark. An assessment of 13.4 cents per week for each workman is levied. The maximum number of workmen covered in any one country may not exceed 80,000; the maximum period during which any employer may receive benefits is five weeks; and the maximum payments to the employers of any one country in any year cannot exceed \$53,600. See **ARBITRATION AND CONCILIATION**.

STUDENT CAMPS. See **MILITARY PROGRESSES**.

STYRIA. See **AUSTRIA-HUNGARY**.

SUBMARINES. The submarine was much in the public eye during the year 1915, but this was due to its use in an illegitimate manner—not to its legitimate use. And the extent of its success for this purpose was no measure of its efficacy as a destroyer of warships. As a destroyer of properly guarded heavy ships of war the submarine has so far proved to be a complete failure. Whether this was due to lack of opportunity or other circumstance, or to excellent guarding, was uncertain—but the fact remained. Forty British battleships and 10 battle cruisers were within striking distance of the German submarine fleet for a year. One old battleship was successfully torpedoed in the Channel, and this happened because no destroyers accompanied her. Three British armored cruisers were victims of a submarine, but they offered their throats to the butcher. Two old battleships succumbed to the submarine at the Dardanelles, but they, too, were insufficiently protected. The French lost one and the Italians two armored cruisers through lack of destroyer patrol.

Nor could the German warfare against non-combatants and peaceful shipping be regarded as other than a failure. The German war zone decree went into effect on Feb. 18, 1915. From that time until June 15th there were 24,442 arrivals and departures of vessels in and from ports of the United Kingdom. During this period, 75 British merchant ships and about the same number of fishing vessels were sunk by submarines. The total interference with commerce was, therefore, about six-tenths of 1 per cent, as regards numbers, but very much less as regards tonnage and value. The "submarine blockade" did not materially reduce the sea-borne trade of Great Britain or France, and on July 1, 1915, the British merchant marine was 229,000 tons greater than when the war began. At the same time the German navy had lost about 40 submarines, mostly with their crews. A number were sunk by ramming, but the greater part were captured in the wire nets which the British navy set in all directions in the way of the Germans.

Submarine warfare against commerce reached its height in the week ending August 25th, when 24 vessels of 80,175 tons were destroyed. The protests of the United States and of other neutrals, and the obvious futility and inexpediency of continuing the submarine operations in northern waters led to a gradual cessation of activity, so that by Nov. 1, 1915, the interference with British commerce had become practically nil. The following table is probably about correct, but the difficulty of ascertaining the facts in regard to losses of fishing boats and other small craft make an exact statement impossible.

BRITISH MERCHANT AND FISHING VESSELS DESTROYED BY SUBMARINES FROM FEBRUARY 18 TO NOVEMBER 1, 1915

	<i>Week ending</i>	<i>No.</i>	<i>Tonnage</i>		<i>Week ending</i>	<i>No.</i>	<i>Tonnage</i>
Feb.	24...	10	26,941	July	7...	10	31,068
Mar.	8...	2	1,988		14...	11	10,651
	10...	4	9,916		21...	..	..
	17...	8	22,825		28...	24	8,798
	24...	3	11,680	Aug.	4...	21	21,738
	31...	8	27,008		11...	20	66,905
Apr.	7...	10	8,888		18...	23	28,617
	14...	2	6,587		25...	24	80,175
	21...	2	9,942	Sept.	1...	4	9,179
	28...	6	2,816		8...	16	45,174
May	5...	28	14,710		15...	4	7,998
	12...	10	48,152		22...	3	5,791
	19...	9	9,411		29...	6	20,727
	26...	2	2,141	Oct.	6...	5	..
June	2...	11	28,948		13...	4	..
	9...	89	20,856		20...	1	..
	16...	18	26,894		27...	1	..
	23...	5	5,501		31...	0	..
	30...	19	12,928				

The number of non-combatants (including women and children) killed by the Teutonic allies through their submarine warfare—Feb. 18 to Dec. 31, 1915—was about 2200. Aside from the losses of vessels sustained by Great Britain, other nations suffered from submarine war on commerce between Feb. 18 and Nov. 1, 1915, as follows: France, 24 vessels; Russia, 20; Italy, 7; Belgium, 6; Norway, 41; Sweden, 20; Holland, 6; United States, 5; Portugal, 2; Greece, 2.

The British submarines have not done much better. They have dived beneath mine fields and destroyed vessels beyond them and performed various feats, showing that what they have failed to do has not been owing to a lack of enterprise. One object of importance they did achieve. They traversed the mine fields at the entrance to the Baltic and, in conjunction with the Russian cruisers and destroyers, went far towards breaking up the German trade with Sweden and so closed the last hole in England's iron grip upon Germany's commerce. The Austrian submarines seemed to be worthy coadjutors of the German in the destruction of non-combatants and neutrals, and to be equally ineffective in breaking up the enemy's blockade.

So far as design is concerned the past year 1915 did not develop much that was new or important. The disadvantages of large size, and particularly of undue length, are fully appreciated. These disadvantages are of course greatest in harbors and in other crowded waters, but they are felt everywhere and several submarines have been sunk through inability to avoid ramming. Yet without adequate dimensions we cannot get sufficient speed, nor great radius of action.

The rôle of the fleet submarine has not yet been entirely cleared up. It will probably be compounded of scouting and a first line of of-

advantageous situations, the yield is not sufficient to supply domestic demands. Wine, timber, and cattle are imported, although all are produced. Live stock in 1911: horses, 144,128; mules, 3151; asses, 1566; cattle, 1,443,483; sheep, 161,414; goats, 341,296; swine, 570,226; beehives, 225,030. Cotton and silk manufactures, clocks and watches, dairy products, etc., are important articles of export. The dairy industry comprehends several distinct branches—the manufacture of butter, cheese, condensed milk, and milk chocolate. The timber industry and pisciculture are important, as are also salt mining, and the manufacture of cement and alcoholic liquors. Outside of the big business plants, house industries employ large numbers of both men and women; watches and clocks, gloves and other leather goods, pottery, tobacco, and snuff, etc., are thus produced. The silk and cotton industries employ in the neighborhood of 60,000 persons. The quantity of silkworm eggs placed for hatching in the spring of 1912 was 188 hectograms; production of cocoons, 31,200 kilograms, compared with 42,835 kilograms in 1911. In 1913, 335 hectograms and 30,798 kilograms.

COMMERCE. By decree of the federal council dated Aug. 2, 1914, the export of foodstuffs has been prohibited from that date, and by decree dated September 18 the export of cotton has been prohibited from the latter date. Exceptions may be granted. The imports and exports of merchandise by countries of origin and destination for comparative years are shown in the table below, in thousands of francs:

	1911		1913	
	<i>Imps.</i>	<i>Exps.</i>	<i>Imps.</i>	<i>Exps.</i>
Germany	581,395	274,879	630,870	805,660
France	539,638	132,627	847,985	141,250
Italy	180,629	85,284	207,025	89,153
Aus.-Hun.	113,884	85,045	108,469	78,858
U. K.	99,857	212,920	112,666	236,165
Neth.	23,998	9,871	25,384	11,589
Belgium	38,926	25,226	35,110	28,188
Spain	24,772	22,800	29,210	80,677
Rumania	32,346	9,056	14,990	7,959
Russia	89,580	48,064	71,467	58,719
Other Europe.	27,177	32,305	.....	.....
U. S.	75,085	142,228	117,898	136,432
Canada	11,868	24,486	19,847	30,966
Argentina	29,232	28,405	86,942	29,864
Brazil	18,550	18,152	20,089	20,406
Colombia	11,055	1,517	7,725	22,142
Other S. A.	16,888	19,568	12,027	26,204
Asia	48,144	47,135	58,485	58,296
Africa	32,732	15,298	34,644	20,117
Australia	13,188	14,396	13,654	17,490
Unstated . . . . .	.....	8,099	.....	7,773
Other	250,237	319,282	321,231	349,695
Total	1,802,359	1,257,309	1,919,816	1,376,399

Imports and exports of coin and bullion in 1913, 58,054,945 and 34,409,773 francs respectively; in 1911, 41,484,268 and 31,528,813 francs respectively; in 1910, 42,890,821 and 28,258,200. Total trade in 1913, 1,977,871,225 francs imports and 1,410,808,889 francs exports; in 1911, 1,843,843,263 francs imports and 1,288,838,217 francs exports; in 1910, 1,787,911,832 and 1,224,130,331. The principal articles of import for consumption and of export of domestic produce are shown in the table below, values for 1913 in thousands of francs:

<i>Imports</i>	<i>1000 fr.</i>	<i>Exports</i>	<i>1000 fr.</i>
Cereals, etc.	213,400	Cottons	237,200
Silk	171,000	Watches	183,200
Coal	106,800	Silks	137,400

<i>Imports</i>	<i>1000 fr.</i>	<i>Exports</i>	<i>1000 fr.</i>
Animals	60,400	Machinery	99,800
Cottons	59,600	Cheese	70,100
Chemicals	70,600	Spun silk	86,600
Precious metals	64,400	Chemicals	67,500
Woolens	60,400	Raw silk	54,500
Iron	65,700	Chocolate	58,200
Cotton	57,000	Milk	47,700
Wine	52,800	Cotton yarn	24,100
Meat	42,700	Hides	25,400
Machinery	52,100	Iron mfrs.	21,800
Sugar	40,200	Straw mfrs.	15,000
Timber	30,700	Woolens	14,800
Iron mfrs.	37,500	Jewelry	15,100
Wool	24,900	Woolen yarn	12,500
Leather	30,800	Animals	11,200

COMMUNICATIONS. There were Jan. 1, 1912, 5112 kilometers of railway in operation. Most of the railways have been nationalized, but the state lines do not show a uniform working profit nor, in some cases, any profit at all. The Swiss railways employ about 42,000 persons, of whom 35,200 work on state lines and 6800 on private railways. These figures are exclusive of the tramways or funiculars, which for the most part are common to the municipalities of the cantons. The rolling stock in 1912 included 1594 locomotives, 4879 passenger cars, and 18,344 freight cars. Passengers carried during 1912, 2,523,874,190; merchandise transported, 1,437,481,565 metric tons. Receipts from operation during 1912, 248,844,972 francs; expenses, 165,038,834 francs—not including extraordinary expenditures, which are not charged in this account. Cost of construction to end of 1912, 1,923,255,656 francs. Receipts from state railways for June, 1915, amounted to \$901,200, as compared with \$1,474,409, for June, 1914. Revenue from goods traffic receded from \$1,981,397 in June, 1914, to \$1,688,200 for 1915.

Telegraph lines, 3575 kilometers, with 26,532 of wires; stations, 2374. Telephone lines, 21,335 kilometers, with 360,425 of wires. Post offices, 1957.

FINANCE. The details of (actual) revenue and expenditure in 1914 are seen in the following table:

<i>Revenues</i>	<i>1000 fr.</i>	<i>Expenditure</i>	<i>1000 fr.</i>
Customs, etc.	65,080	Military	36,808
Investments	3,571	Interior	16,940
Military	5,112	Ind. and agr.	13,614
Posts and Rys.	85	Customs, etc.	9,535
Real property	2,138	Debt charge	16,952
Ind. and agr.	1,054	Justice, etc.	2,239
Justice, etc.	981	Administration	1,476
Interior, etc.	131	Political	1,108
Administration	104	Posts and Rys.	6,711
Political	84	Miscellaneous	1,327
Miscellaneous	18		
Total	78,311	Total	100,844

Estimated revenue for 1915, 76,490,000 francs; estimated expenditure, 99,990,000 francs. State loans Jan. 1, 1915, amounted to 280,810,000 francs.

ARMY. The Swiss army had been mobilized during the great European war and had rendered efficient service in the protection of the neutrality of Switzerland. The Swiss military system is based on universal military service where every citizen serves his country, and only those physically unfit or deprived of the right to be soldiers by penal servitude or bankruptcy, can be excluded from the army, and such as are disqualified are required to pay a military tax, if financially able to do so. Cases of refusal to do military duty are rare, and Switzerland's equipment

is one of citizen soldiers. The military system is based on uniform obligation, gymnastic instruction in all schools, with cadet corps, and military instruction in certain secondary schools where rifle practice is also given. From 17 to 19 the physical training takes into consideration the future needs of the army, so that when a young man of the age of 20 is called to service he is prepared to take up his responsibilities with a minimum amount of training. There are three classes of service in the army—the Elite, 20 to 32; the Landwehr, 33 to 40; and the Landsturm, 41 to 48. The Elite constitute the field army, the Landwehr the forces requiring less physical vigor, and the Landsturm troops for lines of communication and internal police duty. The recruit when first called to service has a period of service of 67 days in the infantry, 92 in the cavalry, 77 in the artillery, garrisons, and fortresses, and 62 days in the sanitary, the quartermaster's department, and the department of transportation. Various repeat courses are held for periods of two weeks, and those recruits who desire warrants or commissions must spend extra time in study and practice. The Swiss army is not maintained on a war basis, neither is it ever on a peace footing, and as a result every period of exercise and maneuver involves a mobilization equal to that of war, and each militia man must keep in his home his uniform, arms and equipment, subject to inspection, and replaced at his own expense if lost or injured. When the call for mobilization comes the militia is uniformed and equipped, and has but to draw certain articles from the regimental depot to be completely equipped for service. The cavalryman brings his own horse, and the supply of horses for artillery and transport are all carefully worked out. A regiment is ready in 48 hours to join its division at the appointed rendezvous. In 1914 a mobilization of the entire army, Elite, Landwehr, and Landsturm, was carried on simultaneously, and it was reported that the degree of organization was such that it could have been mobilized on the frontier in 48 hours, in sufficient force to resist the advance of a cavalry corps charged with the destruction of the railroads. It is estimated that this militia system yields to the republic a drilling army of from 250,000 to 260,000 first line troops, and 80,000 to 90,000 territorials, or a total of 10 per cent of the population, not counting those under 20 years of age.

GOVERNMENT. The constitution of May 29, 1874, vests the executive authority in a federal council (seven members) presided over by the President of the confederation, who, with a Vice-President, is elected annually. The council is elected for three years by a federal assembly composed of a national council (167 members, directly elected for three years by popular vote) and a council of states (44 members, directly elected in some of the cantons and in others by the legislative authorities). Ecclesiastics alone are ineligible for office among Swiss citizens over 20 years of age. The principles of the referendum and recall are in force. To the federal government alone is given power to make treaties and to declare war, and in its control are the army and the postal, financial, and customs departments. The Treaty of Vienna (1815) guarantees the neutrality of Switzerland. On Dec. 15, 1915, Vice-President Camille de Coppet

was regularly elected President of the federal republic, and Edmund Schulthess, Vice-President.

HISTORY. The maintenance of neutrality imposed heavy financial burdens upon Switzerland. On January 13th President Motta announced that the cost of the war to his country had thus far amounted to \$22,000,000. To defray this extraordinary expenditure, special war taxes were authorized by a referendum on June 7th, and three successive war loans were emitted, the first amounting to \$6,000,000; the second, \$10,000,000; the third, \$20,000,000. On September 21st, President Motta made an important speech before the National Assembly, estimating the cost of Swiss mobilization up to September 1st at \$28,000,000. If the war continued much longer, the President declared, new sources of revenue would have to be created, such as a government tobacco monopoly. By November 1st the cost of the war to Switzerland had risen to the figure of \$51,000,000. By reason of the country's central position, Switzerland was able to render the belligerents valuable humanitarian service in facilitating the exchange of disabled prisoners (consult **WAR OF THE NATIONS**). Switzerland also afforded a convenient meeting place for peace conferences and Socialist gatherings (see **SOCIALISM**).

SYLVESTER, FREDERICK OAKES. American artist, died March 2, 1915. He was born in Brockton, Mass., in 1869, and graduated from Durfee High School in Fall River in 1888. The four years following he studied art in the Massachusetts Art School, and was a teacher of drawing and painting at the Central High School at St. Louis, from 1892-1913. He painted many landscapes, chiefly of mid-Western scenes, and was also known for his mural decorations. He received medals at several expositions, and was a member of many societies of artists. He was the author of *Verses* (1900), and of *The Great River* (1911), which contains 24 half-tones from oil paintings by the author.

SYNTHETIC AMMONIA. See **CHEMISTRY, INDUSTRIAL**.

SYPHILIS. See **INSANITY; LUETIN; PROSTITUTION; and SALVARSAN AND NEOSALVARSAN**.

SYRACUSE UNIVERSITY. A coeducational institution for higher education, founded in 1870, in Syracuse, N. Y. The total enrollment in all departments in the autumn of 1915 was 4012. The faculty numbered 315. There were no notable changes in the membership of the faculty during the year, and no noteworthy benefactions were received. The productive funds amounted to about \$2,000,000, and the annual income to about \$500,000. There were in the library 100,196 volumes.

TAIWAN. See **FORMOSA**.

TALL BUILDINGS. The business depression of 1914 was reflected in the small amount of construction of high office and other buildings in New York and other cities in the United States in 1915. One of the notable structures of the year was an earthquake-proof tower, 302 feet in total height, and 234 feet in height to the top of its square portion, built at the University of California. In this Jane K. Sather Campanile, as it was known, particular attention was paid to stability under earthquake shock. The Campanile is of steel covered with reinforced concrete, with the main tower faced with granite and the peak with

marble. There is a pyramid at the top which supports a bronze lantern and four clock faces are set near the top of the square portion, above which is a chime of bells. An elevator runs to the level just below the belfry floor. The granite tower is 36 feet square at the ground line and tapers to 30 feet at the top, the frame being bolted 10 feet below the crown to a reinforced concrete foundation 48 feet square. The total weight on the foundation bed of hardpan was 6875 tons, or 3 tons per square foot, and in addition a wind pressure of 30 pounds per square foot was figured, which increased the weight of the foundation to 4 tons on the leeward side. In computing the earthquake effects, it was recalled that the earthquake of 1906 had a maximum acceleration of 6 feet per second, so that the tower would experience a force of about one-fifth of its entire weight acting like a wind pressure. If the tower were built rigid and unyielding, the pressure at the extreme edge would be 9 tons, but it was designed to have a natural period of vibration of about two seconds. Inasmuch as earthquakes usually have a period of about one second, the shock would not be cumulative, and the two vibrations would tend to oppose each other. The X-bracing is omitted from every other pair of floors in the frame, and the object of the design is to permit the tower to vibrate, but to dampen the impulses. This tower emphasized a point often brought up in connection with tower structures, that strength and flexibility are more essential than mere rigidity.

TARIFF. There was considerable discussion of the workings of the Democratic tariff of 1913 during the year. It was attacked at different times by various manufacturers and associations of manufacturers, and it was blamed by politicians for the existence of hard times. In the early fall preceding the primary election Republican speakers, notably Senator Lodge in Massachusetts, emphasized the tariff as a prominent factor in the industrial depression which had existed and forecast it as the chief issue in the presidential campaign of 1916. Secretary of Commerce Redfield made answers to numerous objections in addresses and published letters; and the tariff was defended by leading publicists. Statistics were presented to show that it was not injurious to the woolen trade; that the knit goods industry was thriving in spite of manufacturers' protests; that, contrary to claims, the pottery industry had not been adversely affected; and that the price of sugar to the public had been lowered.

In the latter part of the year the business revival became so pronounced that discussion shifted to the relation of the tariff to foreign trade following the war. In July a campaign to secure a permanent non-partisan tariff commission was launched with the support of leading manufacturers and publicists in all parts of the country. This propaganda was well organized and supported and brought the issue clearly before the entire nation. Shortly thereafter manufacturers in various lines put forward the proposal that a special commission be provided to establish scientific protective rates for industries established during the war. The dye-stuffs industry was believed to be in special need of protection. The President gave assurance that this industry would receive due consideration. The secretary of commerce stated

that his department was devising ways to keep out cheap foreign goods following the conclusion of the war.

THE 5 PER CENT CASES. The tariff act of 1913 provided that a rebate of 5 per cent of the duties should be allowed on goods imported in American vessels, "Provided, That nothing in this subsection shall be so construed as to abrogate or in any manner impair or affect the provisions of any treaty concluded between the United States and any foreign nation." The interpretation of this section was difficult, owing to special trade treaties between the United States and nine other nations besides Cuba. The treaty with Cuba provided for a preferential reduction of 20 per cent from the regular tariff rates. The treaties of other nations contained "most-favored-nations" clauses preventing designation against them, and also sections known as the "reciprocal commercial provision." This latter provision stated that any merchandise imported from the designated country should be assessed the same duties regardless of whether imported in vessels of the United States or of the contracting nation. On June 10th the United States Court of Customs after extensive inquiry formulated the following conclusions: (1) merchandise imported in registered vessels of the United States is entitled to the 5 per cent discount; (2) merchandise imported in the registered vessels of the treaty nations, both back imported and entered after the tariff act of 1913 became effective as well as that previously transported but entered in bond for warehousing and subsequently withdrawn from consumption is entitled to the 5 per cent discount; (3) likewise merchandise imported in American vessels before the act became effective, entered in bond and consequently withdrawn from consumption is entitled to the 5 per cent discount; and (4) merchandise from Cuba is entitled to the 20 per cent ad valorem reduction as well as the 5 per cent discount. In other words, these opinions held that in all of the 14 cases that had arisen the provisions of the law were to be interpreted literally. It was expected that the refunds under these opinions would amount to from \$15,000,000 to \$20,000,000.

TARKINGTON, BOOTH. See LITERATURE, ENGLISH AND AMERICAN, *Fiction*.

TASMANIA. An island south of Victoria, constituting a state of the Commonwealth of Australia. Tasmania covers 26,215 square miles, practically equivalent to the combined area of New Hampshire, Vermont, and Massachusetts, which is 26,194 square miles. Population, census of April 3, 1911, 191,211; estimate of June 30, 1914, 196,757. The capital is Hobart; its population, with suburbs, was 39,948 in 1913. Launceston, the second town, had in 1913 a population of 24,703. Governor in 1915, Sir William Grey Ellison-Macartney (from March, 1913): premier and attorney-general, John Earle. See AUSTRALIA.

TASSIN, WIRT DU VIVIER. American chemist and metallurgist, died Nov. 2, 1915. He was born in Fort Whippel, Va., in 1869, and was educated at Cornell and Harvard universities. For a time he was engaged in applied chemistry, and then became special agent of the United States Geological Survey at the Chicago Exposition. From 1893-1909 he was commissioner and assistant curator of the Division of Mineralogy at

the United States National Museum. From that date he was consulting metallurgist and chemical engineer. He was the author of many papers on scientific subjects, including, "The Characters of Minerals, Gems, and Precious Stones," and "Metallurgy and Heat Treatment of Metals."

TAXATION. Recent tendencies in taxation in the United States include a transition from local to central control in State taxation; a growing tendency for local revenues to be supplied more and more from property taxes and for State revenues to be supplied from corporation taxes of various kinds supplemented by income and inheritance taxes; and an effort of the federal government to supplement the receipts from customs and internal revenue by stamp taxes, income and corporation taxes. During 1915 a very extensive increase in the rates of the federal income tax was advocated, especially the introduction of more rapid progression in rates; and a federal inheritance tax was advocated by the Industrial Relations Commission (q.v.).

INCOME TAX. The total receipts of the income tax for both individuals and corporations for the fiscal year 1915 were \$80,190,000. This was an increase of nearly \$13,000,000 over the year 1914. The tax on individuals produced \$41,046,000. Of this sum New York residents paid \$17,417,500; Pennsylvania, \$4,642,500; Massachusetts, \$2,683,000; and Illinois, \$2,670,600. Incomes of the lowest class, or those under \$20,000 and assessed at 1 per cent, yielded \$16,577,000. Incomes between \$20,000 and \$50,000 yielded \$4,098,000; those between \$50,000 and \$75,000 \$2,496,500; those between \$75,000 and \$100,000, \$2,099,600; those between \$100,000 and \$250,000, \$5,943,800; those between \$250,000 and \$500,000, \$3,328,400; and those over \$500,000, \$6,439,000. Each of these six classes of incomes above \$20,000 is taxed an additional tax ranging from 1 to 6 per cent. The number of persons paying the individual income tax in 1915 was 357,515 or 83 fewer than in 1914.

The tax on the incomes of corporations yielded \$39,144,000. Of this sum New York paid \$10,221,000; Pennsylvania, \$4,725,300; Illinois, \$2,983,000; Ohio, \$2,538,000; Massachusetts, \$1,853,000; California, \$1,620,000; and New Jersey, Michigan, Minnesota, and Missouri more than \$1,000,000 each. From New York alone was paid about one-third of the total yield of the income tax.

NEW YORK. A committee on taxation appointed by Mayor Mitchel in April, 1914, carried on comprehensive and exhaustive studies of taxation methods of cities both in America and abroad. Of this committee Alfred E. Marling was chairman; Frederick C. Howe, secretary; and Prof. E. R. A. Seligman, chairman of the executive committee. Among their reports were two prepared by Dr. Robert M. Haig and included in the *Bibliography* at the close of this article. The committee held a series of public hearings in November. At these and in its deliberations the advocates of the Single Tax, of untaxing improvements, and of a land increment tax were especially insistent. The committee was expected to issue its final report early in the year. It was giving favorable consideration to an income tax for the State and also to a habitation tax, an occupation tax, and a salaries tax for New York City. Previously a committee of the State Legislature, the Mills

Committee, had reported in favor of an income tax for the State. In both cases the new taxes were to provide revenue needed to meet growing expenditures, this increase being estimated at \$200,000,000 for New York City during the next five years. The Mills Committee in October made known a tentative plan for an income tax of 1 per cent on incomes from \$1500 to \$2500; 2 per cent on those above \$2500; and 3 per cent on the net income of corporations.

CORPORATIONS. During the year the final volume of a very extensive report of the Bureau of Corporations (now a part of the Federal Trade Commission) (q.v.), on the taxation of corporations in various States was issued. This covered the methods used in the Southern and Southwestern States. The data covered manufacturing, mercantile, transportation, and transmission companies, and the various kinds of securities issued by them. Methods of taxation in use in the different States, constitutional provisions, statutory requirements, judicial interpretations, and financial results were outlined. It was found that all the States of the Union collect from corporations about \$300,000,000 yearly, not including amounts collected by local civil bodies such as counties, cities, and towns. Railway, insurance, and banking corporations contribute about 40 per cent of the total. Methods of taxation were found to differ much more widely than methods of taxing individuals. Some States, such as New Jersey, Delaware, Vermont, Connecticut, Pennsylvania, and California, endeavor to secure nearly all revenue from corporation taxes. Taking all the 48 States and the District of Columbia together it was found that the taxes paid by corporations constituted about 40 per cent of all revenue, the property tax 35 per cent, the inheritance tax 9 per cent, liquor taxes 7 per cent, and other receipts 9 per cent.

LEGISLATION. A great amount of detailed legislation was enacted with reference to taxes, some in every one of the 45 States whose Legislatures met in 1915. One of the most marked tendencies in such legislation was that toward a concentration of control and supervision of assessment and collection in a State board. New inheritance tax laws were enacted in Kansas, Oklahoma, and South Dakota; and Oklahoma also passed a graduated income tax. Complete revisions of the corporation tax laws were put through in Connecticut, South Dakota, and West Virginia. Massachusetts and Pennsylvania imposed taxes on the transfer of stock. Pennsylvania imposed a tax on anthracite coal of 2½ per cent of its value when ready for the market. Virginia generally revised her tax laws. In Massachusetts a constitutional amendment was passed by referendum vote authorizing the Legislature to impose and levy a tax on incomes which may be graduated. The graduation in this case may be according to the class of property from which derived or through a differentiation of property income from other income, and may permit the exemption of income from property which is taxed. A special commission of investigation was authorized. California, Indiana, and New York also created special commissions for the study of taxation, their reports to be submitted in each case to the next Legislature.

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TAYLOR, FREDERICK WINSLOW. American engineer, died March 21, 1915; born in Germantown, Pa., in 1856, and graduated from the Stevens Institute of Technology in 1883. He entered the employ of the Midvale Company in 1878, and rose to be chief engineer in 1889. He left the employ of this company and began the work of organizing the management of plants of various kinds. He was the originator and chief exponent of the modern principles of business efficiency. He invented the Taylor and White process of treating modern high speed tools, for which he received a gold medal from the Paris Exhibition and from the Franklin Institute. He received over 100 patents for various inventions. His published writings include *Concrete, Plain and Reinforced* (1895); *The Principles of Scientific Management* (1911). He also contributed many articles on scientific management to periodicals.

TAYLOR, JOHN PHELPS. American clergyman and educator, died Sep. 13, 1915. He was born in Andover, Mass., in 1841, and graduated from Yale College in 1862. He then studied for several years at Paris, Bonn, and Vienna. In 1868 he graduated from Andover Theological Seminary. After being ordained to the Congregationalist ministry he became in 1879 pastor of the South Church, at Middletown, Conn. He afterwards held pastorates at Newport, R. I., and New London, Conn. He was professor of Biblical study at Andover Seminary, and in 1895 lectured on Egyptology in the Peabody Institute at Baltimore. From 1884 to 1893 he was contributing editor on archaeology to the *Andover Review*. He was a director of the American Oriental Society from 1881-92.

TEACHING, CARNEGIE FOUNDATION FOR THE ADVANCEMENT OF. See UNIVERSITIES AND COLLEGES, under section so entitled.

TELEGRAPHY. See WIRELESS TELEGRAPHY AND TELEPHONY.

TELEPHONY. The most notable achievement in telephony during the year 1915 was the opening for commercial use, on January 25th, of the transcontinental line from New York to San Francisco, 3400 miles in length, with its two copper circuits carried on 130,000 poles. The total weight of the conductors, each 0.165 inch in diameter, was 5,920,000 pounds. In pursuance of the policy adopted a few years ago, the Bell interests continued to increase their co-operative facilities in connection with the independent telephone systems by the purchase of these companies from time to time as oppor-

tunity offered. At a meeting held in Chicago, the National Independent Telephone Association of America formed a new union, called the United States Telephone Association. Each of the old bodies gave up its existence to form the new association.

There were about 11,000,000 telephones in use in the United States in 1915, of which 9,000,000 were connected in the Bell system, and more than 200,000 persons were employed in the telephone industry. Among the detailed improvements in telephone practice during the year may be mentioned a more flexible and satisfactory intercommunicating type of phone for apartment houses, a loud speaking phone for railway train dispatching, and an all-metal switchboard for ships of the navy. The automatic telephone was improved, as regards details, but nothing was decided regarding the necessity of adopting such a system.

THERMOPHONE. A new type of telephone receiver, based upon discoveries made several years earlier, was perfected by de Lange, and called a thermophone. Its operation depended upon the fact that telephone currents traversing a loop of exceedingly fine platinum wire placed inside a perforated metal cover heated the wire synchronously and the energy so absorbed was transformed into sound. The platinum wire replaced the magnet and diaphragm commonly used as a telephone receiver. The whole apparatus was small enough to be placed in the ear by a person using it, thus leaving both hands free to write memoranda, etc. In the open air the loop of platinum wire emits only a feeble sound, but when enclosed in a perforated shell of aluminum the loudness as well as the distinctness of the sound is greatly enhanced. On account of the small amount of energy in telephonic currents the thermophone was connected in the same circuit with the transmitter. The platinum wire used was about .002 millimeter in diameter. While the general theory of the instrument had not been fully worked out, it was known that the acoustic effect was approximately proportional to the square of the current strength. Variations in the heating and cooling of the wire occurred in synchronism with the vibrations of the microphone at the transmitting end of the line.

The United States army signal corps brought out a portable field telephone and buzzer set that replaced the former standard field buzzer, cavalry buzzer, and field artillery telephone. The line used was a single wire laid on the ground and unwound from a reel carried by a soldier. Even if the line were broken, communication was still maintained by employing a system of Morse signals with the buzzer. Receiver and transmitter were combined in one unit, weighing only 11 pounds.

TELESCOPES. See ASTRONOMY.

TEMPEL'S SECOND COMET. See ASTRONOMY.

TEMPERANCE. See ALCOHOL; LIQUOR REGULATION; LIQUORS; and various States of the United States, section *Politics and Government*.

TENNESSEE. POPULATION. The estimated population of the State on July 31, 1915, was 2,271,379. The population in 1910 was 2,184,789.

AGRICULTURE. The acreage, production, and value of the principal crops as estimated by the

United States Department of Agriculture, in 1914-15, were as follows:

		Acreage	Prod. Bu.	Value
Corn	1915	3,500,000	94,500,000	\$54,810,000
	1914	3,850,000	80,400,000	54,672,000
Wheat	1915	860,000	9,030,000	9,752,000
	1914	720,000	11,160,000	11,718,000
Oats	1915	857,000	8,746,000	4,378,000
	1914	850,000	8,050,000	4,266,000
Rye	1915	18,000	189,000	195,000
	1914	22,000	286,000	280,000
Barley	1915	6,000	144,000	108,000
	1914	5,000	125,000	111,000
Potatoes	...1915	26,000	3,168,000	1,996,000
	1914	35,000	1,505,000	1,870,000
Hay	1915	950,000	1,898,000	19,404,000
	1914	800,000	960,000	16,320,000
Tobacco	...1915	92,900	6 69,875	4,890,000
	1914	77,400	63,468	4,760,000
Cotton	1915	780,000	c 295,000	15,957,000
	1914	915,000	384,000	11,749,000

a Tons. b Pounds. c Bales.

LIVE STOCK. The United States Department of Agriculture estimated that on Jan. 1, 1916, and Jan. 1, 1915, horses numbered 349,000 and 353,000, valued at \$35,249,000 and \$35,300,000; mules numbered 272,000 and 275,000, valued at \$30,736,000 and \$30,250,000; milch cows numbered 366,000 and 355,000, valued at \$14,457,000 and \$14,555,000; other cattle numbered 518,000 and 503,000, valued at \$11,707,000 and \$11,267,000; sheep numbered 661,000 and 674,000, valued at \$2,710,000 and \$2,494,000; swine numbered 1,531,000 and 1,501,000, valued at \$10,411,000 and \$11,708,000. The production of wool in 1915 and 1914 was 1,953,000 and 1,914,000 pounds respectively.

MINERAL PRODUCTION. The production of copper in 1914 was 18,737,756 pounds, valued at \$2,492,108, compared with 19,390,750 pounds valued at \$3,005,566 in 1913. The silver produced amounted to 97,402 ounces, valued at \$53,864. The production of zinc in 1914 was by far the largest ever recorded from Tennessee. This amounted to 10,425 short tons valued at \$1,063,350, compared with 5583 tons valued at \$625,296 in 1913. The iron ore mined in the State in 1914 amounted to 330,214 long tons, compared with 364,092 long tons in 1913. The marketed value in 1914 was \$466,523, compared with a value in 1913 of \$493,556. The total production of coal in the State in 1914 was 5,943,258 short tons, valued at \$6,776,573. This was a decrease of 916,926 tons from the production of 1913. The decrease was due chiefly to the demoralization of the cotton industry, and the general business depression which prevailed during the latter part of 1914. The total number of men employed in the coal mines in 1914 was 10,116 compared with 11,238 men in 1913. The value of the total mineral production in 1914 was \$19,645,213 compared with \$21,008,938 in 1913.

TRANSPORTATION. The total railway mileage in 1915 was 4165. During the year there was an increase of 35 miles constructed by the Tennessee Western Railroad. The Lewisburg and the Northern Railway Company completed its lines during the year. Both these roads are operated by the Louisville and Nashville.

EDUCATION. The total school population of the State in 1914 was 776,895. There were enrolled in the public schools 593,437. The average daily attendance was 431,053. The total number of teachers, male and female, was 12,578.

The total school expenditures for the year were \$6,064,653.

FINANCE. The latest financial report is for the biennial period 1912-14. The report of the State treasurer shows a balance in the treasury on Dec. 30, 1912, of \$785,120. The total receipts for the two year period were \$9,166,870, and the disbursements were \$9,779,579, leaving a balance at the end of the period of \$172,411. The interest bearing bonded debt of \$10,781,000 was due July 1, 1915, and Oct. 1, 1915, and were paid.

CHARITIES AND CORRECTIONS. The charitable and correctional institutions include State Hospital for the Insane and the Deaf and Dumb School at Knoxville, the Western State Hospital for the Insane at Bolivar, Central Hospital for the Insane, and the Tennessee Reformatory, Tennessee Industrial School, Tennessee School for the Blind, and the State Prison, all at Nashville. There is also a branch prison at Petros.

POLITICS AND GOVERNMENT. The Legislature passed in March a bill abolishing capital punishment, except for cases of criminal assault, or life convicts who commit murder. This bill was vetoed by the Governor. A primary bill was killed in the Legislature. Senator Lea and his supporters made a strong fight for primaries in which the Senator would be nominated in 1916, but all measures on the subject failed, and the nomination was left to the Democratic State Committee. The Legislature passed a law designed to bring about a stricter enforcement of the prohibition law. This provides for the removal from office of State, county, or city officials, other than holders of constitutional office, who fail to enforce the laws of the State. A measure forbidding social and fraternal clubs to dispense liquor or maintain lockers for members was also passed. The supervision of the soft drink stands was placed in the hands of the pure food and drug department, and it was forbidden to sell beverages containing more than ½ per cent alcohol. Drug stores are prohibited from selling intoxicants except on bona fide prescriptions given to persons who actually are ill. Attempts to pass a workman's compensation act in the Legislature failed.

The city of Nashville was placed in the hands of a receiver in July. This action followed the disappearance of 11 of the cash books of the city which covered a period from 1908-12. The controller and other citizens filed a bill in chancery asking for a receivership to take charge of the affairs of the city. City Treasurer Charles A. Myers was arrested, charged with the appropriation of \$10,000 of municipal funds. The warrant was obtained by the controller, who had the opposition of all the other city officials. The controller found that the treasurer had misappropriated the sum and obtained it from the local banks as interest money. Mr. Myers was held in \$20,000 bail to appear before the grand jury. The city finance commissioner was also placed under arrest. The grand jury on June 26th returned indictments against the finance commissioner, the controller, and the assistant city treasurer. The latter officer had left for Australia. A recall petition to remove the mayor and city commissioners was circulated. On July 5th the Supreme Court declined to dismiss the petition of the controller for a receiver. T. J. Bailey, the deputy clerk, was appointed master to take evidence on all the charges made against the heads of the city government. He enjoined

the chief officials from carrying out many city contracts, thus tying up more than \$1,000,000 worth of work, a large portion of which was charged as fraudulently let. He also enjoined the city from paying any money to the attorneys employed by the mayor and commissioners to fight the citizens' movement, and declined to dissolve an injunction against the head officials which restrained them from discharging the controller, and reserved a similar decision on this question as well as on the employment of a receiver.

The mayor of Memphis, E. H. Crump, the commissioner of fire and police, and the judge of the Municipal Court were removed from office by the Chancery Court on November 4th, as a result of charges filed against them by the attorney-general of the city. These charges involved allegation of willful failure to enforce the liquor laws. George C. Love was elected mayor.

STATE GOVERNMENT. Governor, Thomas C. Rye; Secretary of State, R. R. Sneed; Treasurer, Porter Dunlap; Auditor, Hayes Flowers; Commissioner of Agriculture, H. K. Bryson; Superintendent of Education, S. W. Sherrill; Comptroller, John B. Thompson; Adjutant-General, Charles B. Rogan; Attorney-General, Frank M. Thompson; Commissioner of Insurance, William F. Dunbar—all Democrats.

JUDICIARY. Supreme Court: Chief Justice, M. M. Neil; Justices, A. S. Buchanan, Grafton Green, S. C. Williams, and D. Lansden; Clerk, Preston Vaughn.

STATE LEGISLATURE:

	<i>Senate</i>	<i>House</i>	<i>Joint Ballot</i>
Democrats	26	72	98
Republicans	7	27	34
Democratic majority..	19	45	64

TENNESSEE, UNIVERSITY OF. A State institution for higher learning founded at Knoxville, Tenn., in 1874. The total enrollment in all departments in the autumn of 1915, not including medical, dental, and pharmacal students, was 715. The faculty numbered 242. There were no noteworthy changes in the membership of the faculty during the year, and no benefactions of special note were received. The productive funds of the university amount to about \$300,000. The library contains about 40,000 volumes. The president is Brown Ayres, Ph.D., LL.D.

TENNIS. See **LAWN TENNIS.**

TERRESTRIAL MAGNETISM. See **CARNEGIE INSTITUTION OF WASHINGTON.**

TETANUS (LOCKJAW). The prevalence of the germ of this dangerous and often fatal disease has been emphasized in the article on **FOURTH OF JULY INJURIES** (q.v.). The occurrence of the germs in the soil was demonstrated in specimens from the streets of 26 out of 38 cities. Many men who work in stables are tetanus carriers, as are certain horses. Thirty per cent of the examinations of the feces of men so employed yielded positive results, showing the presence of the germs. W. H. Park of New York states that 15 per cent of calves and horses about New York City harbor tetanus bacilli in their intestines. The spores have unusual viability. Protected from sunlight and deleterious influences, they may live and remain virulent for years. Trifling scratches, without showing ir-

ritation, and even if sealed with dry blood, may provide the point of entrance for the bacillus. Antitetanic serum often cuts short an attack in the case of wounded soldiers, to whom a preventive injection has been given, to be repeated on the first sign of a spasm, as for example a twitching of the sole of the foot.

TEXAS. POPULATION. The estimated population of the State on July 31, 1915, was 4,343,710. The population in 1910 was 3,896,542.

AGRICULTURE. The acreage, production, and value of the principal crops, as estimated by the United States Department of Agriculture, in 1914-15 were as follows:

	<i>Acreage</i>	<i>Prod. Bu.</i>	<i>Value</i>
Corn 1915	7,450,000	175,075,000	\$101,544,000
1914	6,400,000	124,800,000	92,352,000
Wheat .. 1915	1,475,000	22,862,000	24,462,000
1914	1,082,000	14,066,000	18,925,000
Oats 1915	1,250,000	44,875,000	18,838,000
1914	900,000	22,500,000	10,800,000
Rye 1915	2,000	84,000	85,000
1914	2,000	30,000	30,000
Barley .. 1915	9,000	2,32,000	171,000
1914	8,000	200,000	140,000
Rice 1915	260,000	7,930,000	7,058,000
1914	239,700	8,012,000	7,454,000
Potatoes . 1915	42,000	2,730,000	2,866,000
1914	44,000	2,684,000	2,791,000
Hay 1915	450,000	a 765,000	6,044,000
1914	450,000	788,000	7,722,000
Tobacco . 1915	200	b 100,000	27,000
1914	200	116,000	24,000
Cotton .. 1915	10,200,000	c 3,175,000	168,812,000
1914	11,931,000	4,592,000	149,574,000

a Tons. b Pounds. c Bales.

LIVE STOCK. The United States Department of Agriculture estimated that on Jan. 1, 1916, and Jan. 1, 1915, horses numbered 1,186,000 and 1,192,000, valued at \$92,040,000 and \$92,976,000; mules numbered 768,000 and 753,000, valued at \$76,800,000 and \$75,300,000; milch cows numbered 1,119,000 and 1,086,000, valued at \$57,069,000 and \$51,585,000; other cattle numbered 5,428,000 and 5,121,000, valued at \$179,667,000 and \$162,336,000; sheep numbered 2,156,000 and 2,144,000, valued at \$7,977,000 and \$6,765,000; swine numbered 3,197,000 and 2,880,000, valued at \$24,617,000 and \$25,920,000. The production of wool in 1915 and 1914 was 8,643,000 and 9,280,000 pounds respectively.

MINERAL PRODUCTION. The coal production of the State in 1914 was 2,323,773 short tons, valued at \$3,992,459. The coal production is divided nearly evenly between lignite and bituminous, the balance being slightly in favor of the bituminous. With the exception of the production of 1913 the production of 1914 was the largest on record. It was less than in 1913 by 105,371 tons. The production of petroleum in the State in 1914 broke all previous records, exceeding the output of 1913 by about 34 per cent. The production was 20,068,184 barrels, compared with 15,009,478 barrels in 1913. Texas ranks fourth among the States in the production. The value of the production in 1914 was \$14,942,848, compared with a value of \$14,675,593 in 1913. The value of the total mineral production in 1914 was \$30,363,426, compared with \$31,666,910 in 1913.

TRANSPORTATION. The total mileage of railways in the State in 1914 was 15,569. There was no construction during 1915. The railways having the longest mileage are the Galveston, Harrisburg, and San Antonio, 1331; Missouri, Kansas, and Texas, 1119; the International and

Great Northern, 1106, and the Texas and Pacific, 1038.

EDUCATION. The school population in 1914 was 1,433,476. About 870,000 were enrolled in the public schools. The Legislature of 1915 enacted a compulsory attendance law, established a county board of education, and appropriated money for the purpose of establishing a department of vocational training in the high schools. Three assistant superintendents were provided for in the same Legislature.

FINANCE. The report of the State treasurer for the fiscal year 1914 shows a balance Aug. 31, 1913, of \$333,815. The receipts for the year amounted to \$14,274,728, and the disbursements to \$12,886,734, leaving a balance on hand on Aug. 31, 1914, of \$1,721,609.

CHARITIES AND CORRECTIONS. The State charitable and correctional institutions include the State Penitentiary at Huntsville, State Penitentiary at Rusk, State Lunatic Asylum at Austin, North Texas Hospital for the Insane at Terrel, S. W. Insane Asylum at San Antonio, State Orphans Home at Corsicana, State Epileptic Colony at Abilene, Deaf and Dumb Institute at Austin, State School for the Blind at Austin, Confederate Home at Austin, Woman's Confederate Home at Austin, Deaf, Dumb, and Blind Institute for Colored Youth at Austin, State Juvenile Training School at Gatesville, State Tuberculosis Sanatorium at Carlsbad, and Girls' Training School at Gainesville.

POLITICS AND GOVERNMENT. A resolution was introduced in the Legislature in February providing for the creation of a new State in the "Pan Handle" of West Texas. The new creation was to be called the State of Jefferson. No definite action was taken on the resolution. The right of Texas to form new States was conferred by the act of Congress, which admitted it to the Union. By the provision of this act, four new States of convenient size and of sufficient population may, by the consent of the voters in the State at large, be formed out of the territory of Texas. This special privilege was due to the fact that Texas came into the Union as an independent republic, and not as a Territory. A resolution for a constitutional amendment providing for woman suffrage was defeated in the House by a vote of 90 to 32. The resolution required 94 votes to pass under a two-thirds rule.

STATE GOVERNMENT. Governor, James E. Ferguson; Lieutenant-Governor, W. P. Hobby; Secretary of State, John G. McKay; Adjutant-General, Henry Hutchings; Attorney-General, Benjamin F. Looney; State Treasurer, J. M. Edwards; Comptroller, H. B. Terrell; Superintendent of Public Instruction, W. F. Doughty; Land Commissioner, J. T. Robinson; Commissioner of Agriculture, Fred W. Davis; Commissioner of Insurance, John S. Patterson—all Democrats.

JUDICIARY. Supreme Court: Chief Justice, Nelson Phillips; Associate Justices, James E. Yantis and W. E. Hawkins; Clerk, F. T. Connerly.

STATE LEGISLATURE:

	<i>Senate</i>	<i>House</i>	<i>Joint Ballot</i>
Democrats	31	142	173
Republicans	..	1	1
Democratic majority..	31	141	172

TEXAS, UNIVERSITY OF. A State institution for higher education founded at Austin, Texas, in 1883. The total enrollment in all departments in the autumn of 1915 was 2603, and the faculty numbered 237. There were no notable changes in the membership of the faculty during the year and no noteworthy benefactions were received. The productive funds amounted in the course of the fiscal year to \$2,000,025. The income from these funds amounted to \$193,994, and from legislative appropriations \$711,682. The library contained 114,000 volumes.

TEXAS FEVER. See **VETERINARY MEDICINE.**

TEXTILE MANUFACTURING. The textile industry in the United States during the year 1915 generally speaking enjoyed a period of prosperity for which in great measure the war was responsible. This was not the result so much of orders from foreign nations, especially in the way of uniforms and similar materials, as in the indirect results which war conditions brought about. In the first place, foreign importations were restricted to a minimum, and what was equivalent to the highest kind of tariff wall prevented foreign competition. The active stimulation of trade in other industries increased the purchasing power of the nation, and led to increased domestic consumption of textiles. Of course the dyestuff situation referred to later was an important consideration during the year, but its effects were dreaded more in the future than at the time. The number of colors, however, was cut down and mills were very careful about taking orders where shades were involved. In all lines of textiles the mills were sold ahead at the end of the year, and especially in wool and silk. Prices were advanced but without any very great effect on consumption. While European manufacturers were cut out from competition in the American markets, it was believed that they were accumulating raw material in the United States and elsewhere, so as to be ready for a distinctly commercial campaign to regain the lost markets after the conclusion of the war. Among the farseeing men in the industry in America this condition was looked forward to with considerable apprehension.

During 1915, in addition to the war, other conditions were abnormal. The tariff revision had somewhat unsettled matters, and later came embargoes on wools from Great Britain and her colonies, which, however, were afterwards modified. Boston became the world's largest wool market, and more of this material was handled in the United States than ever before. The amount imported and withdrawn from bond was estimated at 340,000,000 pounds, to which must be added the domestic clip of over 630,000,000 pounds. The cotton industry was in satisfactory condition during the year, and during the last six months there was a distinct upward trend of values which led to increases in wages in some cases. Here again the dyestuff situation threatened and was a material factor in connection with the advance in prices.

The knitting industry also flourished with an increased demand for new mills. In knitted products there was a large increase in American exports, especially to South America, and knitting was recognized as one of the most important of the American textile industries. The hosiery trade suffered from increased competition and the high cost of dyes, but the underwear in-

dustry was being carried on with unrestricted progress, and mills were working to greater capacity than ever. The increased use of silk continued in the knitting industry, hosiery, underwear, and sweaters consuming large amounts of the fibre silk.

Outside of war exports in the way of uniform cloths, shirtings, blankets, etc., the foreign orders came in certain amounts, and more than usual from Central and South America. The future of the export trade with these countries and with Europe was also a subject for discussion, and manufacturers were wondering whether America would be able to hold the place in foreign markets and a satisfactory standing be gained through war conditions.

Mill construction during 1915 was somewhat in excess of the previous year, though for the first six months there was considerable uncertainty and manufacturers were undecided about increasing their plant and equipment. According to the annual statistical summary prepared by the *Textile World Journal*, the total number of new mills built in 1915 was 219, as compared with 245 for 1914 and an annual average of 260 for nine preceding years. The low record for this period is 208 new mills established in 1911, and the high mark is 303 new mills in 1906. Cotton, wool, and silk mill construction showed a decrease from 1914, while the knitting industry which was in a flourishing condition exhibited a slight gain. The accompanying table gives a comparison of new mill construction for 10 years:

COMPARISON OF NEW MILL CONSTRUCTION FOR TEN YEARS

	Cotton	Wool	Knitting	Silk	Misc.	Total
1915	24	19	111	25	40	219
1914	26	21	110	51	37	245
1913	27	24	142	54	30	277
1912	37	24	122	46	36	265
1911	32	20	92	38	26	208
1910	67	31	113	84	29	274
1909	80	47	105	37	20	289
1908	47	23	94	38	25	222
1907	64	25	83	51	39	262
1906	74	56	103	36	34	303

New cotton mills constructed in 1915 included 24 new mills or separate large new departments for existing mills, totaling 351,272 spindles. As regards distribution, 6 of these were in the New England States, 14 were in the Southern States, 3 in Pennsylvania, and 1 in New York. The South again led in the number of new spindles, most of the new plants in other States being small specialty mills. North Carolina was in first place with 8 new mills with 106,000 spindles and 1132 looms. Seven of the new mills were to manufacture cotton yarns. Georgia reported 3 new mills with a total of 64,000 spindles and 900 looms. The increase in the original plant of the Republic Cotton Mills at Great Falls, S. C., calling for 40,000 spindles and 1000 looms, gave South Carolina third place. Many improvements were made in the old-fashioned mills, replacing old equipment and balancing departments, showing a tendency to strengthen organizations, while the growth of the automobile industry led to a heavy demand for tire fabrics. One new plant for this class of material was in course of construction, and practically all the larger manufacturers were making increases. A comparison of spindles in new cotton mills for 10 years is shown in the accompanying table:

COMPARISON OF SPINDLES IN NEW AMERICAN COTTON MILLS FOR TEN YEARS

	New England	Southern States	Middle and Western	Totals
1915	112,000	239,272	.....	351,272
1914	109,000	186,172	.....	245,172
1913	75,000	250,760	7,000	332,760
1912	94,400	437,000	1,700	533,100
1911	170,500	172,000	4,920	347,420
1910	468,714	214,028	12,500	695,242
1909	599,000	527,528	79,968	1,206,496
1908	115,000	91,198	8,500	209,693
1907	113,000	294,745	10,250	417,995
1906	171,000	294,956	27,040	492,996

Of the 19 new woolen and worsted mills in 1915, 6 were in New England, 9 in Pennsylvania, and 1 each in California, Georgia, New Jersey, and New York. Most of the new enterprises, however, were reported small and of less importance than some of the changes and extensions made by old companies. The year was notable for the starting up of idle mills, partly as a result of war orders, and it was difficult to find a mill capable of manufacturing profitably that had not been leased or purchased and put in operation. The American Woolen Company acquired another mill in Maine, and the Cleveland Worsted Mills Company added another mill in Philadelphia to its properties.

The knitting industry maintained its position as the fastest growing branch of the textile manufacture in number of new establishments, 111 new enterprises being established in 1915, as against 110 in 1914. The industry continued to concentrate in Pennsylvania, New York, and New Jersey, these three States having 68 per cent of all the new mills. Pennsylvania alone had 45 new knitting establishments, against 14 for all the Southern States and 5 in New England. In the South the extension of existing mills was noticeable. In addition to the ever growing demand for knitted underwear, the popularity of knitted outer apparel had developed opportunities for bringing out many novelties. This had stimulated the inventive ability of the knitting machinery manufacturers to produce equipment for manufacturing more desirable and finer products at a reasonable cost, and the range of the latter increased enormously.

The scarcity of dyestuffs during the year was an interesting situation, not only on account of the important demand which could not be supplied by the limited materials imported, but for the future when it was realized that a number of the great manufacturing companies who were making benzol for explosives would after the war use their equipment for the manufacture of dyestuffs, such corporations including the Du Pont interests, the General Chemical Company, the Benzol Products Company, the United States Steel Corporation, and the Standard Oil Company. With dyestuffs in abundance it was believed that the export market, especially for colored cottons, could be kept, once an entrance was secured, just as colored fabrics from Massachusetts and Maine mills had been well received wherever shipped abroad.

THAYER, EZRA RIPLEY. American scholar and educator, died Sept. 14, 1915. He was born in Milton, N. H., in 1866, and graduated from Harvard University in 1888. Three years later he took his degree at the Harvard Law School. For the year following he was secretary to Justice Horace Gray, of the United States Supreme Court. He then returned to Boston, where

he began the practice of law. From 1896 to 1900 he was a member of the firm of Brandeis, Dunbar, and Nutter, and for the next 10 years he was a member of the firm of Storey, Thorndike, Palmer, and Thayer. In 1910 he was appointed Dane professor of law, and dean of the Law School of Harvard University, and retained that position until his death. He was a member of the committee of the American Bar Association, which in 1908 drafted a code of professional ethics, which was adopted by the association. Dr. Thayer had been in ill health for about two years prior to his death, and he met death by his own hand.

THEATRE. See ARCHITECTURE; DRAMA, AMERICAN AND ENGLISH.

THEOCIN. A diuretic drug having a similar chemical composition to theophyllin, a natural alkaloid found in tea. It is also closely related to caffeine, being a dimethylxanthin, while caffeine is a trimethylxanthin. Theocin itself is not readily soluble in water and its sodium salt (acet-theocin-sodium) is generally given instead of it. Theocin is a powerful diuretic and is used to eliminate the dropsies of cardiac and vascular and nephritic origin.

THEOLOGICAL SCHOOLS. See UNIVERSITIES AND COLLEGES.

THEOSOPHICAL SOCIETY, THE. A society founded in New York on Nov. 17, 1875, by Helena Petrovna Blavatsky, assisted by Henry S. Olcott, William Q. Judge, and others. Its international headquarters were removed in 1879 to Adyar, Madras, India, the residence of Mrs. Annie Besant, the president of the society. Its objects were: (1) To form the nucleus of a universal brotherhood of man; (2) to study and compare and make known the ancient religions, philosophies, and sciences; (3) to investigate the laws of nature and develop the latent powers of man. Madam Blavatsky went to India in 1878, accompanied by Olcott, and in that country a propaganda was begun and numerous branches organized. Later the society was divided into three sections: Indian, English, and American. Subsequent disputes led to the formation in 1895 of an independent society in America. Differences as to succession and leadership again followed, resulting practically in the disintegration of the American society, whose New York headquarters were broken up. Theosophists in 1915 were divided into 23 territorial sections, at the head of each section a general secretary: America, England and Wales, India, Scandinavia, Hungary, France, Italy, Germany, Australia, Cuba, Finland, Russia, Bohemia, Switzerland, South Africa, Scotland, Dutch East Indies, Belgium, Netherlands, Austria, Burma, Norway, New Zealand, South America, Spain, and Ireland were not included in the division into territorial sections, and were governed by presidential agents. In the Theosophical Society in 1915 there were about 30,000 members, and in the American section there were about 5000 members, and 157 branches. Socially considered, the Theosophical Society is based on the principle of the brotherhood of man; but the theories of reincarnation and Karma are at the root of its philosophical system. The president of the American section is A. P. Warrington, Los Angeles, Cal.

THERMOPHONE. See TELEPHONY.

THOMAS, JESSE BURGESS. American theologian, died June 6, 1915. He was born in Ed-

wardsville, Ill., in 1830, and graduated from Kenyon College in 1850. He studied law and was admitted in 1852 to the bar. From 1860-62 he practiced law in Chicago, and in the latter year gave it up to become pastor of a church in Waukegan, Ill. After serving in several pastorates in Chicago, San Francisco, and Brooklyn, he was appointed in 1888 professor of church history in the Newton Theological Institute. He held this position until 1903 when he became pastor emeritus. His published writings include, *The Old Bible and the New Science* (1877); *The Mould of Doctrine* (1883); *Some Parables of Nature* (1911). He received the degrees of D.D. from the University of Chicago and LL.D. from Georgetown College, Kentucky.

THORIUM. A new medical use for this substance has been discovered by Burns, namely, as a medium opaque to the X-ray, which can be injected into the bladder, ureter, and pelvis of the kidney. (Burns used a neutral solution of thorium nitrate and sodium citrate.) This solution has the advantage of being nontoxic, non-irritating, and quite fluid, besides its property of giving a distinct, clear shadow on the X-ray negative. The colloidal solutions which have been used for this purpose, viz. bismuth, iron, silver, copper, lead, calcium, and magnesium, have various disadvantages, some of them being viscous and difficult to inject, others being quite poisonous and irritating. The thorium solution has also the advantage of being comparatively inexpensive. See CHEMISTRY, INDUSTRIAL.

THYMUS GLAND. See ROENTGEN RAYS.

TIBET. A Chinese dependency in central Asia. The estimated area is 756,000 square miles, including Koko-Nor and Tsaidam. There are widely varying estimates of population; perhaps 2,000,000 is as plausible as any. The capital is Lhasa, with an estimated population of 15,000 to 20,000, including a large number of Buddhist monks. To some extent grazing and a primitive agriculture are carried on, and gold, borax, and salt are worked. The trade is principally with China and India. The Dalai Lama, who fled to India in 1910, was restored to his office by the Chinese government in 1912 and resides at Lhasa. The Simla agreement of April 27, 1914, provides that China shall not convert Tibet into a Chinese province and that Outer Tibet shall not be represented at any future Chinese Parliament. The British agent at Gyantse is allowed to visit Lhasa with his escort should occasion require.

TICK, CATTLE. See VETERINARY MEDICINE.

TICK ERADICATION. See VETERINARY MEDICINE.

TIMBER. See FORESTRY.

TIME, STANDARD. Standard time in the United States was somewhat threatened during 1915 by a movement in certain Middle Western States to adopt Eastern Standard Time in place of Central, most of the States concerned being in the Central Time zone, which extended west from Buffalo. Michigan in 1885 had passed a law making Central Time the legal time for the whole State, but notwithstanding this fact, Detroit during the year adopted Eastern Time, following the example of the city of Cleveland, which passed such an ordinance in 1914. This example was followed by Saginaw and Bay City, but the change produced such a disturbance that these cities were forced to change back again, with corresponding confusion. It

was reported during the year that the Chamber of Commerce of Cleveland intended to urge on Chicago that that city adopt Eastern Time, and then it was proposed that the movement be extended to have Eastern Time Standard for Omaha, Denver, and Salt Lake City.

The original dividing line between Central and Eastern, or 75° meridian, time, was Buffalo, which then was a natural dividing railway point, being the junction of the New York Central and being approximately on the same meridian as Pittsburgh, and once adopted by the railroads this division of time became standard for popular use as well. It was proposed that if the new time standard was desired by the people of eastern Ohio, that a new dividing line could be arrived at, but the proposition to upset the carefully worked out plan of American standard time was one that was occasioning serious concern. The agitation was distinctly comparable to that for saving daylight so prominent in England before the war.

TIN. About 155 short tons of tin ore (equivalent to 104 tons of metallic tin), valued at \$66,560, were reported for 1914, against 120 tons of 60 per cent ore in 1913, valued at \$46,699, and 147 tons of 60 per cent ore in 1912, valued at \$124,800. In 1911 the output of tin was valued at \$56,635, and in 1910 at \$23,447. The imports of tin for consumption were valued at \$32,943,059 in 1914, \$46,946,756 in 1913, \$50,372,478 in 1912, \$43,346,394 in 1911, and \$33,913,255 in 1910.

The tin production and consumption of the world in 1915 and previous years are given in the accompanying table from the *Engineering and Mining Journal*:

TIN PRODUCTION AND CONSUMPTION (In Long Tons) <i>Engineering and Mining Journal</i>				
	1913	1914	1915	
Exports, Straits and Malay Peninsula	62,242	61,986	66,760	
Exports, Australian	3,253	1,771	2,275	
Banks and Billiton sales	17,142	10,975	15,093	
Chinese exports and production*	8,200	8,255	7,097	
Bolivian exports*	22,719	24,844	18,800	
South African production*	1,900	2,276	2,158	
Nigerian production* .....	.....	1,962	1,899	
Cornwall production*	4,900	4,500	4,000	
Total	120,856	116,569	118,082	
U. S. imports and consumption	45,900	42,995	49,480	
Great Britain, imports and consumption	28,786	80,581	89,937	
Holland, imports	16,578	15,810	7,625	
Other Europe, imports	21,250	18,638	11,550	
Australian consumption	1,000	1,050	1,100	
China and India consumption	6,500	6,400	6,650	
Totals	119,959	115,419	116,342	
Visible stocks, Dec. 1	16,045	13,432	14,535	

* Not in "Statistics."

For the manufacture of tin plate a practically pure tin is required, and this is obtained in large quantities only from the Straits Settlements, so that practically 90 per cent of the 45,000 tons of tin imported into the United States comes from this source. As there is a prohibitive export duty on tin ores in the Straits Settlements this involves the refining to metallic form in the country of its production. Aside from the Straits Settlements, Bolivia is the largest producer of tin, and its ores were

shipped to England and to a less extent to the United States, a new plant of the American Smelting and Refining Company having been constructed at Perth Amboy, N. J., to smelt the impure Bolivian and other ores.

The output of tin in the Far East ran about the same in 1915 as in earlier years, with a slightly increased production. By May the importation of tin into the United States from Great Britain under consular supervision acted to relieve a shortage in the United States due to the official prohibition of the exportation of Straits Settlements tin to other than British ports. In November rumors concerning the stoppage of British vessels in the Suez Canal also produced a sharp advance in price, and it was reported at the end of the year that the British government intended to curtail exports until a safe stock could be accumulated, but this announcement was premature as the British government contemplated only a few thousand tons to be so held.

The tin production of Bolivia was greater than in 1914, when there was a depression in the industry. A regular market for tin ore was re-established in England, and the exports from Bolivia in 1915 were estimated at 42,000 tons of concentrates averaging 60 per cent tin, as compared with 37,260 tons in 1914, and 44,600 tons in 1913. It was expected that the tin production of Bolivia would increase with improved facilities for mining and milling and for transportation, but it was doubtful whether it would exceed 60,000 tons of concentrates for some time to come. The new plant of the American smelting and Refining Company at Perth Amboy, N. J., was designed for the smelting of tin ores and concentrates and the electrolytic refining of tin. The plant was more or less an experiment, but the company has patents for electrolytic refining already issued and others pending. In England electrolytic tin has been found to reach 99.98 per cent pure, while the base metal from which this was produced contained only 93 per cent tin. Electrolytic tin was found by tin plate manufacturers equal in every respect to the best Straits tin.

In Australia the tin mines, and the smelters in Tasmania were actively engaged during the year, though in some cases the dry weather and the effect of the war on the metal market interfered with sluicing operations. The scarcity of water handicapped the dredging in New South Wales, in the Tingha and Emmaville districts, but they continued to be systematically worked, while at the Ardlethan tin fields the production was in excess of that of previous years. Queensland also showed an increase over 1914, while a certain amount of tin was also produced in Western Australia. In Alaska about 200 tons of stream tin were produced in 1915, the greater part of which came from the York district of the Seward Peninsula where two dredges were operated on Buck Creek. Other dredges were operating on various rivers, where the placers carried both gold and tin, and developments were continued on various lode-tin mines. In the lower Tanana Basin tin mining was also done, and considerable tin was recovered incidental to gold placer mining.

TIBOL. See AUSTRIA-HUNGARY.

TIRPITZ, ALFRED VON (1849—). A German naval officer and secretary of state for the navy in the present imperial cabinet. He was

born at Küstrin-on-Oder; entered the Prussian navy as a cadet in 1865; became a second lieutenant in 1869, a lieutenant-captain in 1875, a captain in 1888, a rear admiral in 1895, a vice admiral in 1899, and an admiral in 1903. In 1896-97 he was commander of the cruiser division in Eastern waters. In 1897 he became secretary of state for the navy, taking the place of Hollman. He was ennobled in 1900 and decorated with the Order of the Black Eagle in 1907. In 1908 he became a life member of the Prussian upper house; in 1911 he was appointed lord high admiral; and at the outbreak of the great European war came into prominence, on the score of the declaration of the "war zone" and the "submarine blockade." The former stated that the waters around the British Isles were a war zone (a new idea in international law), and that neutral vessels sailed these waters at their own risk. In 1915 considerable damage was done to non-combatant and neutral shipping in these waters by German submarines. The most spectacular loss was the *Lusitania* (q.v.). This new method of warfare strained relations between the United States and Germany and for a time it looked as though the submarine policy of von Tirpitz were going to be abandoned. As a matter of fact, it was not largely successful. For a fuller account of the diplomatic intercourse between the United States and Germany, see UNITED STATES AND THE WAR. In the latter half of the year several submarines were shipped overland to Austria and Turkey and were active in the Mediterranean Sea.

TISDALL, FITZGERALD. American educator, died Nov. 11, 1915. He was born in New York City in 1840, and graduated from the City College in 1859. He became a member of the faculty of the college, and held that position continuously until his death. He held the chair of Greek language and literature. From 1870-79 he was the director of the Cooper Union School of Science and Art. In 1910 a celebration was held to commemorate his fiftieth anniversary as a teacher. He was a member of many learned societies, and received several honorary degrees. He was the author of *Heroic Hexameter* (1899).

TOBACCO. The tobacco crop of the United States in 1915 was grown on the largest area ever recorded for this crop, 1,368,700 acres. The total production, 1,060,587,000 pounds, was the third largest on record. The production of leaf of cigar types amounted to 182,155,000 pounds, grown in the New England States, Pennsylvania, Miami Valley in Ohio, Wisconsin, New York, Georgia, and Florida, in the order named. The production of chewing, smoking, snuff, and export types was 870,048,000 pounds; and of all other types 8,384,000 pounds. The total farm value of the crop December 1 was \$96,041,000. The yields were fair but prices were below normal.

The United States is not only the greatest producer of tobacco in the world, but it is the largest exporter, the largest importer, and the largest consumer. Considerably more than a third of the production in normal years is exported. The exports of tobacco in the fiscal year 1915 amounted to \$54,000,000, an increase of \$10,000,000 over the preceding year, but practically the same as in 1913.

The year was a very depressing one for all

tobacco industries in the United States except cigarette manufacture. The Commissioner of Internal Revenue reports the following output on which tax was paid during the fiscal year 1915: Large cigars, 7,058,122,323, a decrease from 1914 of over 600,000,000; small cigars, 972,263,280, a decrease of more than 64,000,000; cigarettes, 16,756,179,973, an increase of nearly 330,000,000; snuff, 29,839,074 pounds, a decrease of nearly 3,000,000 pounds; chewing and smoking tobacco, 402,474,245 pounds, a decrease of 10,000,000 pounds. The receipts from the internal revenue tax on tobacco and the tobacco industry in 1915 amounted to \$79,957,373.54, which represents a decrease of \$29,266.14.

The latest figures for the world's crop of tobacco are for 1912, estimated at 2,835,740,000 pounds. Of this amount the United States produced about 35 per cent, followed in order by India, Russia, Austria-Hungary, and Dutch East Indies. The lack of quantity in the Turkish and Cuban crops is more than made up in quality and corresponding value. The war has had the effect of greatly depressing the tobacco industry of Cuba. The exportation of cigars and cigarettes during the fiscal year 1914-15 represented a decrease in value of nearly \$5,500,000 as compared with the previous fiscal year. The export of leaf tobacco also fell off more than \$4,500,000. Many factories have had to close and others to cut their forces. A decree promulgated by the government in November, 1914, authorizing the granting of bounties on raw tobacco and cigars produced in Cuba and exported to foreign countries, was not put into effect, but the government appropriated a half million dollars for alleviating the condition of the laborers in this industry, and furnished free transportation to the cane growing districts.

Tobacco manufacture is a monopoly in Austria, France, Italy, Spain (private), and Japan, and its growing is also subject to governmental restriction in Austria, France, and Japan. The monopoly in Greece was terminated in July, 1914. The German government is reported to have under consideration the instituting of a government monopoly in cigarettes. Profits to the government arising from the monopoly in Austria amounted in 1912 to \$43,400,000, and in Italy to \$61,585,400.

During the year an interesting statistical and descriptive treatise of the production, manufacture, and trade of tobacco in various countries, entitled "Tobacco Trade of the World," was issued by the United States Department of Commerce (*Special Consular Reports*, No. 68). See also under ALCOHOL.

TOBACCO TRUST. See TRUSTS.

TOBAGO. See TRINIDAD AND TOBAGO.

TOGO. A German West African protectorate on the Guinea coast between Dahomey and the Gold Coast. The estimated area, 87,200 square kilometers (33,668 square miles), is somewhat larger than the State of Maine. Estimated native population, 1,032,000; whites, Jan. 1, 1913, 368, of whom Germans 320. Missions, 3 Protestant and 1 Roman Catholic. Schools, 367, with over 14,000 pupils. In 1912-13, 46 whites and 6503 natives were convicted in the courts. Imports and exports in 1907 were valued at 6,700,000 and 5,916,000 marks respectively; in 1910, 10,817,000 and 7,222,000; in 1912, 11,428,000 and 9,959,000; in 1913, 10,631,000 and 9,138,000. Imports from and exports to Germany

in 1911 were valued at 3,814,000 and 6,076,000 marks; in 1912, 4,820,000 and 5,808,000. Principal exports in 1912 and 1913: gold, 1,935,000 and 3,199,000; silver coin, 1,933,000 and 3,195,000; palm kernels, 3,380,000 and 2,558,000; raw cotton, 515,000 and 582,000; palm oil, 1,413,000 and 518,000; rubber, 976,000 and 360,000; cattle, 506,000 and 334,000; cacao, 243,000 and 333,000. Vessels entered in 1912, 258, of 571,832 tons (German, 414,721). A railway connects Lome (or Port Lome) with Anecho, in Little Popo, 44 kilometers; with branches from Lome to Palime, 119 kilometers, and Lome to Atakpame, 164 kilometers; total railway, 327 kilometers (203 miles). Local revenue in 1912-13 and 1913-14, 3,380,000 and 3,500,000 marks; expenditure, 4,060,000 and 4,180,000. For 1914-15, the budget balanced at 4,177,943 marks. Lome is the capital and chief port.

HISTORY. The surrender of Togoland on Aug. 25, 1914 (see *YEAR BOOK* for 1914) placed the Anglo-French allies in possession of 320,000 rounds of ammunition, 1000 rifles, and 3 Maxim guns. More than 200 Europeans also surrendered to the victorious invading army. During 1915, in accordance with a provisional agreement entered into in September, 1914, the territory was under the joint supervision of the Governor of the Gold Coast and the Lieutenant-Governor of Dahomey. A chief political officer at Port Lome was in command of the troops of occupation. Private-owned property was not interfered with by the Allies.

TOLL, WILLIAM EDWARD. American bishop of the Protestant Episcopal Church, died June 27, 1915. He was born in Wisconsin in 1844. He was educated at Nahotah House, Wisconsin, and in 1872 became a priest of the Protestant Episcopal Church. He was assistant in Grace Church, Chicago, for one year, when he became rector of St. James's Church, Cleveland. After holding pastorates in several churches in Illinois he was appointed archdeacon of the diocese of Chicago in 1907. In 1911 he was consecrated first suffragan bishop of the diocese of Chicago.

TOLLS, PANAMA CANAL. See *PANAMA CANAL*.

TOLSTOY, ALEXEI. See *RUSSIAN LITERATURE*.

TOMPKINS, CHARLES HENRY. An American soldier, died Jan. 18, 1915. He was born in Fort Monroe, Va., in 1830 and was a cadet at the United States Military Academy from 1847-49. From 1856-61 he served as private and non-commissioned officer in the United States army. In March, 1861, he was appointed second lieutenant in the second cavalry. He resigned from active service in 1862. He reentered the service as lieutenant-colonel of volunteers in 1865, and was appointed colonel in the following year. In the same year he reentered the regular service as lieutenant-colonel and deputy quartermaster-general. He was appointed colonel and assistant quartermaster-general in 1881. In 1894 he was retired by operation of law. By the act of 1904 he was advanced to the rank of brigadier-general. He received brevets of lieutenant-colonel for gallantry in three separate actions and was awarded also the Congressional Medal of Honor.

TONGA, or THE FRIENDLY ISLANDS. Three groups of South Sea islands, constituting a British protectorate. Area, 390 square miles. Pop-

ulation in April, 1911, 23,011 Tongans, 346 other Pacific islanders, and 380 Europeans. The natives are Christian, mostly Wesleyans. At the end of 1913, there were 61 government schools, with 2730 pupils, and 14 Roman Catholic schools, with 469 pupils. Imports and exports in 1913, £81,044 and £82,320. The exports are chiefly copra (£72,480). Revenue in 1913-14, £32,489 and expenditure £39,103. The King is George Tubou II, who was born in 1874 and succeeded his great-grandfather in 1893. The capital is Nukualofa.

TONGKING. The most northerly division of the colony of French Indo-China, bounded on the north by the Chinese provinces of Yunnan and Kwangsi. Hanoi, the capital, is also the capital of French Indo-China. The chief crop is rice; others of importance are sugar cane, cotton, cardamoms, corn, and tobacco. See *FRENCH INDO-CHINA*.

TORONTO, UNIVERSITY OF. A state coeducational institution founded in 1827, under the name of Kings' College, at Toronto, Canada. The total enrollment in the various departments of the university in 1914-15 was 4428, and the faculty numbered 401 members. The administrative officers for 1915-16 include: President, Robert Alexander Falconer, LL.D.; registrar, James Brebner; bursar, Ferdinand Albert Mouré; librarian, Hugh Hornby Langton. With the additions of the year, the library now contains 141,936 volumes.

TORPEDOES. See *NAVAL PROGRESS*; and *SUBMARINES*.

TOWN PLANNING. See *CITY PLANNING*.

TRACHOMA. A contagious disease of the conjunctiva (the membrane which covers the eyeball and lines the eyelids) which generally results in blindness. The disease gains entrance to this country frequently through immigrants, who are closely inspected for it on landing. Its cause has not been settled beyond a peradventure. The bacterial theory is borne out in about 52 per cent of the cases, while poor hygienic surroundings and lowered resistance have an important influence in determining it. There appears to be no immunity, either congenital or acquired. During the year Axenfeld, of Jena, has stated his belief that the common bacterial infections are readily implanted on a trachomatous base, and that mixed infections furnish the "acute trachomas." More knowledge obtained from the laboratory is necessary before the real nature of the disease can be affirmed.

TRACY, BENJAMIN FRANKLIN. American public official and financier, died Aug. 6, 1915. He was born on a farm in Owego, Tioga County, N. Y., in 1830; was educated in the common schools and at the Owego Academy, and after studying law was admitted to practice when he was 21 years of age, in 1851. Two years later he was elected district attorney of Tioga County, and was the youngest official holding office in New York. On the foundation of the Republican party he became county chairman, and in 1860 was elected district attorney as a Republican. He subsequently formed a law partnership with his opponent, Gilbert C. Walker, who was later Governor of Virginia. In 1861 he was elected a member of the Assembly, and in a short time was acknowledged leader of his party in that body. In July and August, 1862, he raised the 109th and 113th New York Volunteers and was made colonel of the latter regi-

ment. He first saw active service in the Wilderness, where he received a medal of honor for bravery, and was afterwards brevetted brigadier-general. Not long after, his health failed and he was obliged to resign from the army. After a short stay in Owego, he returned to the front and was appointed colonel of a negro regiment. He held this position until Lee's surrender, when he went to New York City, becoming a member of the law firm of Benedict, Burr, and Benedict. In 1866 he was United States district attorney for the eastern district of New York. During his tenure of office his work in preventing tax frauds and convicting those guilty of them won him high fame. To help his work he drew up and caused to be passed the conspiracy act, whereby two or more persons guilty of defrauding the Federal government could be punished by imprisonment. This law with slight changes still remains in effect. He resigned his office in 1873 and gave himself up to private practice. In 1881 he was appointed to fill temporarily a place on the bench of the New York Court of Appeals. He sat for only one year. General Tracy maintained an active connection with the Republicans in Kings County (Brooklyn), and was one of the three men who practically controlled the organization. In 1881 he was nominated for mayor of Brooklyn on condition that he would withdraw if he could unite the warring sections, and after bringing about harmony he retired in favor of Seth Low. He continued in law practice and political work until 1889, when he was appointed secretary of the navy by President Harrison. He was active in the building of the battleships *Massachusetts*, *Indiana*, and *Oregon*, and the fast armored cruisers *New York* and *Brooklyn*. After the close of his term of office he resumed his private practice in New York. General Tracy took part in many famous law suits, the most conspicuous of which was perhaps the Tilton-Beecher trial in 1876. He was one of the counsel for the defense of Henry Ward Beecher. General Tracy was a schoolmate of Thomas C. Platt, and a warm personal and political friend. He was for many years head of the law firm of Tracy, Boardman, and Platt, but retired to become a member of Coudert Brothers. One of his most conspicuous services was performed in 1896, when he acted as a chairman appointed by Governor Morton to draw up a charter for Greater New York. While General Tracy was secretary of the navy, his wife and daughter were burned to death in a fire which destroyed his home at Washington. He was a leader in the movement for strong sea-power for the United States. His efforts in building up the navy gave him the title of "the father of the fighting navy." Up to a few days before his death, he insisted that more ships and still more ships should be constructed until the navy was proportionate to the greatness of the country.

TRADE-MARK LAW. See **TRADE UNIONS.**

TRADE UNIONS. The principal matters of interest to organized labor in the United States during 1915 included the final decree in the Danbury Hatters' Case (see **BOYCOTT**), the completion of the work of the **INDUSTRIAL RELATIONS COMMISSION** (q.v.), and the settlement of important trade disputes as set forth under **ARBITRATION AND CONCILIATION** and **STRIKES AND LOCKOUTS**. The activities of radical labor parties were not pronounced either in the United

States or abroad (see **INDUSTRIAL WORKERS OF THE WORLD**). The American Federation of Labor continued to represent the most powerful association of workmen in this country. At its annual convention and otherwise in America as well as abroad, the gradual growth of sentiment in favor of the formation of labor organizations on the broad lines of great industries rather than on narrow craft lines was clearly shown. See for further cross references the article on **LABOR**.

LEGISLATION. Laws referring specifically to trade unions are few. In 1915 Congress re-enacted a proviso, first included in an appropriation bill in 1913 and implied in the Clayton Act of 1914, that no part of the appropriation for the enforcement of the antitrust laws should be spent in the prosecution of individuals or organizations for combining to increase wages, shorten hours, or better the conditions of labor, or for any act, not in itself unlawful, done in furtherance of these ends; nor in the prosecution of farmers or organizations of farmers who cooperate to maintain fair and reasonable prices. Arizona made the discharge of an employee for membership in a union a felony. California gave trade unions the exclusive right to use labels or trade-marks adopted and registered by them. The willful reproduction or counterfeiting of such union label, or the false statement that union labor was used in the production of any article, or the performance of any service when, in fact, non-union labor was exclusively used, were made punishable by fine or imprisonment or both. In Massachusetts savings banks were required to report the deposits of labor unions. Missouri so amended her trade-mark law as to enable trade unions to adopt a label or card to designate places where union labor is employed. The willful display of any such label or card, except by union authorization, or the willful counterfeiting of any such, was made punishable by fine, imprisonment, or both. Washington passed a very severe law against picketing, making it a misdemeanor and including under it continuously moving back and forth in front of a place of business, or carrying any kind of a sign for the purpose of calling attention to the existence of a trade dispute, or of hindering a person in the conduct of his business, or of preventing him from employing any person. West Virginia's act creating a department of mines provided that no one shall be prevented by intimidation from working in any mine, but on the other hand this is not to prevent men from organizing and persuading others not to work. In addition to the foregoing Colorado, Indiana, and Michigan enacted laws for the arbitration of trade disputes, and such laws may be viewed as furthering the interests of trade unions in that they place a premium on collective bargaining.

Much sentiment prevailed in trade union circles in favor of peace at the earliest moment. On April 15 the Central Federated Union of Greater New York demanded a general strike of all men employed in making munitions for export, and there was strong feeling favorable to the "peace-at-any-price" position. Many union men were drawn temporarily into the agitation led by Labor's National Peace Council (see **LABOR**). On June 18th a great meeting called by the Central Federated Union at Carnegie Hall was attended by delegates represent-

ing about 6,000,000 organized workers, including the American Federation of Labor, the Farmers' National Union, and the railway brotherhoods. William J. Bryan was the principal speaker, but his views were vigorously opposed by President Samuel Gompers.

On May 4th the Ohio Supreme Court declared unconstitutional a law preventing the discharge of an employee for membership in a labor union. This decision was based on a previous ruling of the United States Supreme Court (see under LABOR). A minority of the court protested against the decision as unfair to organized labor.

NATIONAL WOMEN'S TRADE UNION LEAGUE. This organization held its fifth biennial convention at New York City beginning June 7. There were present 89 delegates representing about 100,000 members. The league has branches in New York, Philadelphia, Baltimore, Chicago, Springfield, Ill., Kansas City, Denver, and Los Angeles. The trades represented included garment, boot and shoe, glove, bindery, and suspender workers, stenographers and typists, waitresses, journeymen tailors, grocery clerks, commercial telegraphers, bookkeepers and accountants, cloth hat and cap makers, hat trimmers, ladies' waist and dress makers, beer bottlers, and telegraph operators. Much time was given to the discussion of the school for organizers recently opened at Chicago, but in great straits for lack of funds. It was desired to establish a number of scholarships to pay the expenses of women taking the courses. The curriculum would include courses in the philosophy and history of trade unionism, labor legislation, parliamentary law, and the woman's movement. Resolutions were passed favoring peace, and protesting against secret diplomacy; favoring the avoidance of war with Mexico or any European country; demanding the abolition of the manufacture of arms and munitions; and approving the Women's Peace Congress at The Hague. These peace resolutions were presented to President Wilson by a special delegation on June 18.

The fundamental principles of the league are: organization of all workers; equal pay for equal work; an eight-hour day; a living wage; and full citizenship for women. In addition to these the convention favored the following: uniform State laws; restriction of child labor; prevention of occupational diseases; abolition of sweat shops; at least one day's rest in seven; regulation of prison labor; and the abolition of private detective agencies used by employers in strikes. The official organ of the league is *Life and Labor*, edited by Miss S. M. Franklin. The president since 1907 has been Mrs. Raymond Robins.

ENGLAND. Trade union activity in 1915 dealt primarily with questions of peace and war. The unions showed a reluctance to join wholeheartedly in the plans of the government for increasing the supplies of munitions. They showed a willingness to strike under conditions that embarrassed the government, as illustrated by strikes in munitions plants, on railways, in the Welsh coal mines, and an extensive and stubborn strike of Liverpool dock workers. This led to much denunciation of unions and widespread agitation for compulsory measures. In February the government appointed a committee to deal with disputes in trades supplying

war materials. In March, after much discussion in Parliament and various conferences between David Lloyd George and labor leaders, it was announced that the government would control munitions factories, and that unions would relax their rules and accept arbitration. About the same time it was announced that a truce between labor and capital had been reached to last until the close of the war. Under the law giving the government authority to commandeer any factory and transform it into a munitions plant, the motor plants of Scotland were taken over in April. Meanwhile plans for drawing women into necessary labor met with great success. In March 7000 women volunteered to accept positions in munitions or clothing factories or on farms; by April 1st their number was increased to 33,000; and two months later to 80,000. The unions and others immediately demanded the organization of these women as a means of preventing their use to reduce wages. In September it was announced that the women workers in munitions factories would receive equal pay with men. The proposal to put all factories making munitions under military law was opposed by the vast majority of trade unionists. To avoid such an event labor leaders joined the government in a systematic effort to arouse workers to full realization of their duty to the nation. Later in the year, especially during September, the question of conscription was the most important agitating union circles. The Trade Union Congress in its annual session strongly protested against the resort to compulsory conscription, as contrary to English rights and traditions.

The Independent Labor Party had its convention at Norwich in April and adopted resolutions favoring peace at the earliest possible moment. This, however, was protested against by J. Ramsay MacDonald, president of the party. On April 6th, by a vote of 234 to 9, was adopted a resolution strongly condemning those party members who had assisted in recruiting or otherwise in justifying the war. The Congress demanded that the terms of peace be submitted to the people for approval; that no more secret treaties be made; that a drastic reduction of armaments by all countries be carried out and their manufacture nationalized; and that the British foreign policy be directed to the formation of a federation of nations. The *Daily Citizen*, organ of the party, ceased publication on June 5th.

GERMANY. During the five years preceding the war the trade unions of Germany had grown from a total membership of about 1,000,000 to over 3,000,000. The General Commission of Trade Unions had in this period grown from 716,000 to 2,500,000, embraced in 47 different trades. Of this membership there had enlisted in the armies up to April 30, 1915, nearly 1,000,000, or 40 per cent. The trades furnishing the largest number of enlistments were: metal workers, which had been the largest union in the world, with 554,000 members; building trades; transportation; wood workers; factory workers; book printers; carpenters; municipal employees; and brewery and mill workers. The percentage of members enlisted ranged from 84 for butchers to 21.6 for tobacco workers.

STATISTICS. The following figures give the total trade union membership in principal countries at a recent date: German Empire, 3,792,-

000; United Kingdom, 3,010,000; United States, 2,810,000; France, 1,029,000; Italy, 817,000; Austria, 422,000; Belgium, 211,000; Netherlands, 152,000; Denmark, 143,000; and Switzerland, 114,000.

TRANSFUSION OF BLOOD. This fairly old expedient has been studied attentively of recent years, with increasing areas of its usefulness as a result. Ingenious devices of various kinds have been invented, to simplify or safeguard the technique, to prevent clotting, and to place the valuable expedient within the reach of any one who possesses average surgical ability. But painstaking care and accurate technique will always be prime requisites. During 1915 Ottenberg and Libman, of Mount Sinai Hospital, New York City, have reported a most instructive series of 212 transfusions in 189 cases, of which 45 per cent were successful in improving the patient, and 20 per cent actually resulted in saving life. In the selection of a donor great care must be exercised, to prevent transmission of diseases (syphilis especially), and to exclude the possibility of hemolysis and agglutination. The field of applicability is so extended that transfusion is indicated in simple hemorrhage, as from gastric ulcer or duodenal ulcer, dysentery, typhoid fever, or ectopic pregnancy; in connection with surgical operations, preliminary, postoperative, or during shock; hemorrhagic conditions, as in "bleeders" (hemophilia); purpura, jaundice, etc.; blood diseases, as pernicious anemia; leukemia; infections, as in pyogenic, or infective endocarditis; acute poisonings, diabetic coma; and debilitated conditions, as cancer, malnutrition, simple anemia.

TRANSMISSION OF ELECTRIC POWER.

See ELECTRIC POWER, TRANSMISSION OF.

TRANSVAAL. One of the four original provinces of the Union of South Africa. Pretoria, the seat of the provincial government, had, according to the census of 1911, 48,607 inhabitants (29,618 whites); with suburbs, 57,674 (35,942 whites). The following populations are inclusive of suburbs: Johannesburg, 237,104 (119,953 whites); Krugersdorp, 55,144 (13,132); Germiston, 54,325 (17,507); Boksburg, 43,628 (11,529); Benoni, 32,560 (8639); Roodepoort-Maraisburg, 32,578 (7657); Potchefstroom, 12,989 (8639). There were in the province Dec. 31, 1913, 5,024,898 sheep and 2,104,527 goats. For area, population, production, etc., see SOUTH AFRICA, UNION OF.

TRANSYLVANIA. See AUSTRIA-HUNGARY.

TRAVEL, BOOKS OF. See LITERATURE.

TREATIES. See INTERNATIONAL PEACE AND ARBITRATION, section *Bryan-Wilson Treaties and passim*.

TRENGGANU. A native state, under British protection, on the east coast of the Malay Peninsula. The estimated area is 6000 square miles. Population (census March, 1911), 154,073 (10 Europeans, 149,379 Malays, 4169 Chinese, 61 Indians, 454 of other races). The capital is Kuala Trengganu (13,991 inhabitants), built on both banks of the mouth of the Trengganu River. The following articles are produced for export (value in Straits Settlements dollars, 1913)—fish, SS \$673,396; tin ore, 403,594; copra, 315,981; paddy, 221,991; black pepper, 157,752. Native sultan, Sir Zainal Abidin ibni Almerhum Ahmad. There is a resident British agent.

TRIEST. See AUSTRIA-HUNGARY.

TRINIDAD AND TOBAGO. A British colony, composed of the West India islands of Trinidad (1754 square miles) and Tobago (114). Total population (1911 census), 333,552 (110,911 East Indians). Estimated population March 31, 1914, 352,145. The capital is Port of Spain (1911 census, 59,796); San Fernando (8667) is 30 miles south of the capital. Under cultivation in 1914, about 460,000 acres. Trade and finance statistics follow. Trade figures are for calendar years, beginning with 1909.

	1907-8	1908-9	1910-11	1913-14
	£	£	£	£
Imports	3,374,824	2,682,702	3,843,011	4,968,850
Exports	3,907,503	2,500,195	3,467,588	5,205,673
Revenue	871,201	834,745	948,888	970,789
Expend.	781,088	855,050	927,038	951,982
Shipping * ..	1,798,810	1,987,252	2,771,364	3,636,607

* Tonnage entered and cleared.

The principal exports of local produce in 1913 were: cacao, £1,403,379; sugar, £418,067; asphalt, £230,565; coconuts, £85,369; petroleum, £75,020.

TRINITY COLLEGE. An institution for higher education founded in 1823 at Hartford, Conn. The total number enrolled in all departments in 1915-16 was 237. The faculty numbered 25. There were no noteworthy benefactions received during the year, and no notable changes in the membership of the faculty. The library contained about 70,000 volumes. The president was Rev. F. S. Luther, LL.D.

TRIPLANES. See AERONAUTICS.

TRIPOLI. See LIBYA.

TROELS-LUND. See LUND, TROELS.

TROPICAL MEDICINE. For several years studies have been made of the incidence of intestinal parasites among the inhabitants of the Philippine Islands, the condition having been serious ever since attention was first paid to it after the American occupation. As one passes from temperate to tropical climates, animal parasitism increases and all intestinal and some liver parasites appear to decrease in proportion to the care paid to latrines and sewers. In a very careful study of over 4000 prisoners confined in Bilibid Prison in Manila, made by Garrison in 1911, the commoner parasites appeared in the findings as follows: whipworm, 59 per cent; hookworm, 52 per cent; ascaris, 26 per cent; figures which were lowered by vigorous action by the Bureau of Health. In 1915 a series of studies in nearly 8000 cases, made in 1914, became available, after publication by Willets, of the Bureau of Science, Manila. His summary shows the following percentages of certain forms of parasite: trichuris, 47; ascaris, 41; hookworm, 22; strongyloides, 0.8; oxyuris (seatworm), 0.7; tape worm, 0.7. The patients under examination included 6400 Filipinos and 1400 Chinese. The remarkably low percentage of Chinese attacked, intestinal parasitism being but one-third as great as among the Filipinos, is explained. The Chinese use chopsticks, and not their fingers in handling food; they drink boiled water in the form of tea; they eat less uncooked food; and they were of higher social class. The importance of cleanliness has been impressed upon the residents.

TROTTLING. See RACING.

TRUDEAU, EDWARD LIVINGSTON. American physician, and authority in tuberculosis, died

Nov. 15, 1915. He was born in New York City in 1848, and graduated from the College of Physicians and Surgeons in 1871. In the following year he began practice in New York City, but in 1874 he fell a victim to tuberculosis. He then had an idea of spending the remainder of his life, which he considered would be short, out of doors. He went to Saranac Lake in the Adirondacks, N. Y. He discovered that the open air life in the dry climate of the region greatly benefited him, and he remained there throughout the rigors of an Adirondack winter. The experiment was so successful that he was convinced that nutrition, rest, and open air were the three prime factors in the treatment of tuberculosis. In 1885 he built his first shack for patients. Two men went to live in this to test the ideas evolved by Dr. Trudeau. This was the beginning of the Adirondack Cottage Sanitarium, which, as announced by its founder, was primarily for the treatment of incipient consumption in workingmen and women. It was the first institution of its kind in America. At this time there was a great deal of skepticism among physicians as to the benefit of open air treatment. Dr. Trudeau, however, was successful in obtaining the support of Dr. Alfred Loomis, one of the most notable physicians of the time. The struggle to obtain money for doctors and nurses was a desperate one, but from its small beginning the project reached extensive proportions and finally was rewarded with an endowment fund, which amounted to several thousand dollars, contributed by grateful patients and admirers. In connection with his work of healing Dr. Trudeau also carried on investigations in tuberculosis. His first laboratory was a small room in his own home, and his sole equipment was the microscope. After years of labor and repeated failures he succeeded in obtaining the tubercle bacillus of pure culture and with it began his experiments in inoculating guinea pigs. These experiments were far in advance of any of their time. His discovery that guinea pigs might be protected from certain tuberculosis infection by previous inoculation with bacilli of diminished violence is considered one of the essential prerequisites to the important discovery since made respecting the disease. In 1894 Dr. Trudeau was able to found the Trudeau Sanitarium and a laboratory for the study of tuberculosis. This was the first research laboratory for this work in the United States. On the celebration of the 25th anniversary of the founding of the sanitarium in 1910 Dr. Trudeau received congratulations and tributes from scientists and laymen all over the world. He received honorary degrees from Yale University and the University of Pennsylvania. He wrote many articles in medical publications relating to tuberculosis.

TRUST COMPANIES. See **BANKS AND BANKING**, *Reserve Systems and the Trust Companies*.

TRUSTS. Important developments in the trust problem in 1915 were the organization of the Federal Trade Commission and the various court decrees relating to important industrial combinations.

FEDERAL TRADE COMMISSION. The Clayton Anti-Trust Act of 1914, also known as the Trade Commission Act, provided for the formation of the Federal Trade Commission to consist of five members appointed by the President and Senate for terms of seven years each. Not more than

three of these may be of any one political party; they will receive \$10,000 each per annum, and their secretary \$5000. This commission took over the Bureau of Corporations and was expected to continue the bureau's investigations. About March 1st President Wilson sent to the Senate for confirmation the following nominees to constitute this commission, and to serve the terms indicated: Joseph E. Davies of Wisconsin, Commissioner of Corporations, to serve seven years; Edward N. Hurley, president of the Illinois Manufacturers' Association, six years; William J. Harris of Georgia, at that time Director of the Census, five years; William H. Parry, treasurer of the Seattle Chamber of Commerce, four years; George Rublee of New Hampshire, a lawyer, three years. The first three of these were Democrats and the other two had been supporters of Roosevelt in the Progressive movement. All of these were at once confirmed by the Senate except the last, who was objected to because of political activities. Mr. Rublee was, however, given a recess appointment when Congress adjourned. On July 13th the commission announced the completion of its organization. It had established an administrative branch with a secretary; an economics department under a chief economist to make investigations; an economic board of review to pass on matters before they come before the commission; a legal department, and a board of law review.

UNITED STATES STEEL CORPORATION. The case begun against the United States Steel Corporation under the Taft administration, in the United States District Court at Trenton, N. J., was brought to a decision in that court on June 3rd. The Court unanimously agreed that the corporation should not be dissolved, but both majority and minority opinions were rendered. Two fundamental questions were considered by the Court: In the first place, was the steel corporation when suit was begun in 1911 unduly restricting competition?; and secondly, did this corporation when it was formed in 1901 either by intent or by its inherent nature unduly restrict competition or unduly obstruct the course of the iron and steel trade? The testimony taken covered 15,000 printed pages, and the Court's opinions constituted a complete review of a vast mass of material collected by government bureaus, congressional committees, and court officers. The majority opinion found that while the company's business had increased in 10 years by about 40 per cent, that its eight leading competitors had grown even more rapidly. Thus the business of the Lackawanna Steel Company had increased by 63 per cent; the Republic, 90 per cent; the Cambria, 155 per cent; Jones and Laughlin, 206 per cent; Indiana, 1495 per cent; Bethlehem, 3779 per cent. It held, therefore, that the iron and steel industry had not been monopolized, but that real competition existed. The Court did not disapprove the company's acquisition of the Tennessee Coal and Iron Company in 1907, but considered this an honest and fair business deal. Likewise the agreement whereby Mr. Carnegie sold his interests to the corporation was approved. The Court held that no monopoly of ore or other raw materials was formed. It did not disapprove the size of the corporation, for it held that "the real test of monopoly is not the size of that which is acquired but the trade power of that which is not acquired." The minority opinion held that the

steel corporation intended both to create a monopoly and to restrain trade, and to combine with others so as to monopolize trade within the meaning of the Sherman Act, but it did not possess the power alone to do these things, and that it did unlawfully combine with others in the fixing of prices. On this basis an injunction to prevent future price arrangements with competitors might be issued, but the minority held that sufficient protection would be secured if the Court continued to retain jurisdiction for the purpose of preventing price-fixing methods. The opinion was generally taken as a complete defense of the steel corporation, with the result that a considerable outburst of stock exchange activity followed. Close students of the decision, however, did not believe that the decision represented any new attitude in the interpretation of the Sherman Law since the Court had shown its willingness to either enjoin or dissolve the corporation if the latter had possessed power to commit acts contrary to the anti-trust laws.

On October 28th the Department of Justice filed an appeal from the decision to the United States Supreme Court. In this it contended that the corporation was organized to stifle competition; that the so-called Gary dinners, at which price arrangements with competitors were made, were illegal, had been continued until prosecution was imminent, and in themselves constituted grounds for dissolution.

EASTMAN KODAK COMPANY. In 1913 the government brought suit against the Eastman Kodak Company of Rochester asking for a dissolution of the corporation. The government charged that the company constituted a virtual monopoly having acquired competing plants and obtained monopolistic control of the manufacture of photographic paper, and prevented retailers from selling the products of other concerns. The company offered to make certain changes in its selling policy and business methods, but this was unsatisfactory. The Federal District Court at Buffalo, on August 24th, declared the company an illegal monopoly in restraint of trade and gave it two months for the presentation of a plan of reorganization. The Court found that it had obtained control of from 75 to 80 per cent of the entire trade by wrongful methods. Its profits, the decision stated, were, in 1912, \$15,633,000 on sales amounting to \$24,763,000.

UNITED SHOE MACHINERY COMPANY. In 1911 suit was begun in the Federal Court in Boston against the United Shoe Machinery Company. In March, 1915, the Court dismissed this suit on the ground that the patents of the company enabled it legally to prevent the use of patented machinery by competitors. The Court found no basis for the charge of intended oppression or arbitrary conduct, of a "purpose to destroy what could not be acquired by straightforwardness," or of unreasonableness in enforcing its leases. An appeal was taken to the United States Supreme Court. Moreover, this did not terminate the efforts of the government, for in October a new suit was begun at St. Louis, this being the first important suit brought under the Clayton Anti-Trust Law. The government sought an injunction which would prevent the company from enforcing the contracts by which it binds lessees of its machines to use no machines of its competitors. The government held these practices unlawful as tending to produce monopoly. It

was pointed out that the company controls over 98 per cent of the trade in shoe machinery. Considerable testimony was presented by various shoe manufacturers showing how the United Company had virtually compelled them to use its machines, in some cases even forcing the manufacturer to discard numerous other machines already installed.

NATIONAL CASH REGISTER COMPANY. In the Federal District Court in 1913 Mr. John H. Patterson and 26 associates in the National Cash Register Company had been convicted under the criminal section of the Sherman Law. They had been sentenced to pay fines and to serve various terms of imprisonment. This decision, however, was reversed by the Circuit Court of Appeals in April, and a new trial was ordered. The government in May appealed the decision to the Supreme Court. In this appeal it characterized the case as one of the most important ever brought under the Sherman Act, because it would test finally whether the criminal provisions of the law could be enforced. In the appeal it was contended that conspiracy had been clearly proven; "that these men were steeped in deliberate guilt"; that they had by practically all known means of competition ruined and forced out of business numerous competitors, and had thus acquired 95 per cent of the cash register trade of the United States. In June the Supreme Court declined to review the decision of the Circuit Court of Appeals. This latter court had ruled out two of five counts, and had found no proof of conspiracy on the other three during three years previous to the indictment. Nevertheless, it authorized the government to bring a new suit on one count. This, however, was not deemed by the prosecution a sufficient basis for an effective control.

NEW HAVEN CASE. Both civil and criminal suits were undertaken against the New York, New Haven, and Hartford Railroad Company or its officers. In the civil suit the decree of the Federal Court had ordered a separation of the company from subsidiary companies. During 1915 the company began the sale of various properties and sought legislation in various States facilitating a readjustment of its finances. The control of the Boston and Maine Railroad and trolley lines in Rhode Island and Connecticut were transferred to trustees. Trolley lines in Western Massachusetts and certain steamships were sold, and the New England Navigation Company, which operated steamship lines, was dissolved. The company planned to retain control of the Ontario and Western and the New York, Westchester, and Boston lines, which were not competitors, but it determined to sell several million dollars' worth of property along the latter.

The criminal suit begun in December, 1912, in the Federal District Court of New York City against Charles S. Mellen and 20 other directors charged them with conspiracy to monopolize transportation in New England. During the fall of 1915 numerous witnesses were heard, many days being devoted to taking the testimony of the former president, Charles S. Mellen, who thus obtained immunity. The number of other defendants was reduced to 11 ex-directors, all of whom except William Rockefeller entered special pleas against the application of the prosecution to them individually. The argument of these special pleas was just completed when the Court

adjourned for the holidays, decision being reserved.

KELLOGG TOASTED CORN FLAKES COMPANY. In December, 1912, the government brought suit against this company to restrain it from fixing the resale price of its products, and to prevent it from warning jobbers that if they refused to carry out the fixed price agreement they would be cut off from further supplies of toasted corn flakes. The company contended that its notice to jobbers concerning the resale price was not a violation of law since it was printed on a carton which had been patented with the notice thereon; that is, it claimed that the patent legalized their trade practice. In September, however, by a consent decree of the District Court at Detroit to take effect on October 15th, the company was permanently enjoined from fixing the resale price and from using on its cartons the notice concerning the fixed price.

OTHER SUITS. According to a report of the Attorney-General, the following suits under the Federal Anti-Trust law were among those still in the courts at the close of 1915: against the Great Lakes Towing Company et al. for an alleged combination in the towing facilities on the Great Lakes; against Edward H. Hartwick et al. for an alleged conspiracy in the retail lumber trade; against the Colorado and Wyoming Lumber Dealers' Association and the Lumber Secretaries' Bureau of Information for conspiracy to restrain trade in lumber and its products; against William G. Hollis et al., including the Lumber Secretaries' Bureau of Information, the Lumberman Publishing Company, and certain individuals for combination in the lumber trade; against the Keystone Watch Case Company, in which a decision partly favorable and partly adverse to the government was reached Jan. 2, 1915, decree being entered June 4th, but from which appeal was taken to the Supreme Court; against the American Asiatic Steamship Company for alleged conspiracy and unlawful pooling agreements for the purpose of securing a monopoly in the transportation of freight from the Atlantic Coast of the United States to the Philippine Islands, Japan, China, and the Far East, a suit in which a decision adverse to the government was handed down February 3rd, but from which appeal was taken to the Supreme Court; against the International Harvester Company et al., in which a decision favorable to the government was handed down by the Circuit Court of St. Paul in August, 1914, and which was reargued before the Supreme Court in the fall of 1915; against the Prince Line et al. for maintaining a substantial monopoly in the transportation of freight and passengers between the United States and Brazil, in which appeal was made by the government to the Supreme Court from a decision of the District Court on February 3rd; against the Associated Bill Posters and Distributors of the United States and Canada; against the Motion Picture Patents Company, alleging undue restraint of trade in machines and appliances of the motion picture business, in which decision was awaited, the case having been argued in December, 1914; against the Board of Trade of the city of Chicago, attacking Rule 33 of the board, through which, it is alleged, the prices of corn, oats, wheat, and rye are arbitrarily determined when the board is not in session, the case having been argued in January, 1915; against the Cleveland Stone Company;

against the Corn Products Refining Company, in which a monopolization of trade in corn products is alleged and dissolution of the combination is sought, and in which testimony was taken in 1915; against the American Can Company, alleging a monopoly of the manufacture of tin cans, in which the taking of testimony was completed, and argument was made at the fall term of the District Court at Baltimore; against the Southern Pacific Company to compel relinquishment of control over the Central Pacific Railway Company; against the Lehigh Valley Railroad Company for alleged monopoly in the production, transportation, and sale of anthracite coal, in which an opinion adverse to the government was handed down Dec. 21, 1914, by the District Court at New York, but from which the government appealed to the Supreme Court; against Knauer and 35 defendants for restraining trade in plumbing supplies, in which a verdict of guilty was returned February 24th in the Southern District of Iowa, and heavy fines imposed, but in which appeal was taken on a writ of error; against the Booth Fisheries Company at Seattle, Wash.; against the Western Cantaloupe Exchange at Chicago; against Collins and 30 other commission merchants, alleging a combination to fix arbitrary prices for country produce in the District of Columbia; against McCoach and 32 other master plumbers at Pittsburgh; against Irving and 13 other master plumbers and retail dealers in plumbing supplies at Salt Lake City; against Carl C. King and other members of the Aroostock Potato Shippers' Association at Boston. The suit against the Lackawanna Railroad and its coal company begun in 1913, alleging a combination giving the coal company a monopoly of the sale of anthracite coal produced along the railroad line, was finally decided by the Supreme Court in favor of the government on June 21st. But a suit against the Reading Company and others, constituting what was called the Anthracite Coal Combination, was decided by the District Court at Philadelphia adversely to the government on July 3rd.

TOBACCO INDUSTRY. Following the decree of the Supreme Court in May, 1911, declaring the American Tobacco Company and affiliated concerns and stock holders an illegal combination, there were repeated assertions by independents that oppressive monopolistic conditions still prevailed. Much interest therefore attaches to Part III of the "Report on the Tobacco Industry" of the Bureau of Corporations, issued early in the year. This report dealt with "Prices, Costs, and Profits." The report showed that the percentage of business enjoyed by the independents had dwindled almost continuously. While their share of the business in some branches had increased it had decreased in others, notably in the production of cigarettes. Some small companies with well-known brands showed increased prosperity since the dissolution; but most of the independent concerns showing increased business were the larger ones engaged in the production of various products. As a rule the profits of the independents, especially in the production of navy plug and Turkish cigarettes, were very low. This was explained by their small scale operations, less efficient organization, and their marked inferiority in the costs of distributing their products. Their disadvantage was greatest in the expenses of advertising and maintaining selling agencies. While the report con-

sidered that real competition had been introduced, nevertheless neither wholesale nor retail prices had been affected.

On November 8th representatives of every branch of the tobacco industry met in New York to complete the formation of the Tobacco Merchants' Association of the United States. Jacob Westheim, formerly president of the United Cigar Manufacturing Company, was chosen president. In a statement he declared that the purpose of the new organization was not to limit competition, but to prevent ruinous and reckless competition which had had disastrous consequences in various branches of the trade. Members of the association represented \$1,500,000,000 of capital with an annual business of \$700,000,000. The permanent headquarters were located at 5 Beekman Street, New York City, and branches were established at Chicago, Denver, and San Francisco. The board of directors included representatives of tobacco manufacturers, manufacturers of cigarettes, cigar manufacturers, leaf dealers, and jobbers and retailers.

GERMANY. The war made an extreme test of the economic strength of the German industrial system. This was true not merely of her railways and banks, but of private industry as well. It was believed by expert students of the problem that it was the German cartels that were the chief mainstay in steadying the industrial situation and perfecting the organization made necessary by the unprecedented demands of war. These cartels "are coöperative combines of independent enterprises in allied industries for the purpose of regulating demand and supply and centralizing the business management in the mutual interest." They differ from American trusts in that they are not complete permanent amalgamations, nor are they combinations of capital, but rather coöperative undertakings. At the outbreak of the war they numbered about 600. By means of them the government was able to rapidly survey the economic resources of the Empire. Through them raw materials were readily mobilized, the labor market was steadied, credit of individual firms was strengthened, and business confidence maintained. Their value was evidenced by the fact that on Dec. 5, 1914, the potato-drying industry was, by act of government, brought under a compulsory cartel. Similarly, the Rhenish-Westphalian Coal Syndicate, which was to expire on Nov. 30, 1915, was voluntarily extended until March 31, 1917, under a government threat to compel the continuance of a co-operative arrangement. A similar instance is found in the government War-Grain Company, which took over the control of certain foodstuffs. Since the beginning of the war cartels were formed in the building trades and in industries producing articles of luxury and goods for export. Their value in expediting industrial reconstruction following the war is expected to be very great.

TSETSE FLY. See the article **SLEEPING SICKNESS**.

TUBERCULOSIS. Prophylaxis against tuberculosis, for members of families in which the disease exists, has been practiced by Crofton for eight years, by means of very minute doses of Koch's new tuberculin in a solution of benzoyl chloride, by hypodermic injection. In many members of families so treated the improvement in the general health has been most satisfactory,

and no case of the disease has appeared in individuals so treated. He has employed the inoculations in children as young as three months old. W. H. Park, of New York, studying the transmission of tuberculosis to children through the medium of milk, states that it is fairly certain that when tubercle bacilli in milk are heated to 140 degrees F., and held at that temperature for 20 minutes, they are destroyed. Butter transmits the disease, but the bacilli in it generally die in a few weeks. Bovine infection is most prevalent in early childhood, but the human infection increases up to 15 years of age. The greatest danger to infants and young children is from a tubercular mother or nurse. Removal of the infant from direct human contamination is the only safety. H. Koch, of Vienna, assistant to Von Pirquet, reports excellent results in the treatment of children with tuberculin. Most of his patients were between three and nine years old. The most unfavorable age for this method includes the first three years, and the 11th, 13th, and 14th years. Treatment should last 11 weeks, on the average. Sunlight treatment of tuberculosis received a new impetus in 1915, as advocated by Rollier in 1903. Heliotherapy has always had more adherents in Europe than in this country, but the general out of door tendency carries with it an interest in this method. Rollier warns us that the head must be protected at first with a hat, and that many patients should cover the heart with a wet compress. The method is particularly suited to surgical cases. The action of light is to be regarded as due to the effect of the heating rays as well as the actinic rays, the latter increasing resistance. Incipient cases do best, and after the preliminary treatment they must also engage in work and recreation; but those suffering from hæmoptysis must not attempt it. The death of Dr. E. L. Trudeau, of Saranac Lake, N. Y., reminds us of the increasing interest in fighting the "white plague," whose ravages he was one of the first to combat systematically, by establishing the Adirondack Cottage Sanitarium, in 1884. Now there are 575 sanitariums and hospitals with capacity of 35,000 beds, 450 tuberculosis dispensaries, more than 1000 physicians, and over 4000 nurses devoted wholly to the treatment and study of tuberculosis in the United States. In 1914, \$20,500,000 was spent in the campaign against the dread disease, of which sum 68.8 per cent came from municipal, county, and State or Federal sources. See also **CHARITIES**, *Conference on Blindness and Tuberculosis*; and **VETERINARY MEDICINE**.

TUFTS COLLEGE. An institution for higher education founded in 1852 at Medford, Mass. The total enrollment in all departments in the autumn of 1915 was 1540. There were 26 members of the faculty. There were no notable changes in the membership of the faculty. Noteworthy benefactions included \$150,000 from the estate of H. J. Braker. The productive funds at the end of the fiscal year amounted to \$2,200,000, and the income to \$265,380. The library contained 72,886 volumes. The president is Hermon C. Bumpus, Ph.D.

TULANE UNIVERSITY OF LOUISIANA. An institution for higher learning, founded at New Orleans in 1834. The enrollment in all departments in the autumn of 1915 was 2395. The faculty numbered 310. During the year Dr. William Benjamin Smith was elected emeritus

professor of philosophy, H. G. Dufour, professor of civil law, Miss Florence Peebles, professor of biology, William H. Stevens, professor of business management and organization. The only notable benefactions were \$5,000,000, from the United Fruit Company, and \$6000 from William Irvy. The productive funds of the university amounted to \$4,318,162, and the income to \$212,695. The library contained 69,500 volumes. The president is Robert Sharp, A.M.

TUNGSTEN. See **CHEMISTRY, INDUSTRIAL.**

TUNGSTEN LAMPS. See **ELECTRIC LIGHTING.**

TUNIS. A French protectorate in North Africa lying between Algeria and Tripoli. Capital, Tunis, with 164,608 inhabitants. Total area, 167,400 square kilometers (64,600 square miles); population (1910), 1,706,830 indigeneous Arabs, Berbers, Moors, etc., 49,245 Jews, and about 149,000 Europeans; total population, 1911, 1,929,003. Population figures are estimates.

PRODUCTION. In the mountainous regions are fertile valleys where grazing is carried on; in the lowlands agriculture is practiced, and cereals, olives, vines, etc., are grown. Horses on July 31, 1915, numbered 38,000; donkeys, 86,240; mules and hinnies, 30,250; camels, 123,915; cattle, 269,152; sheep, 1,119,310; goats, 499,164; swine, 12,255. The area under principal crops and the yield for two years are given below, with the yield per hectare in 1913-14:

	Hectares		Quintals		Qa. ha.
	1913-14	1914-15	1913-14	1914-15	
Wheat	405,821	450,000	600,000	8,000,000	1.5
Barley	818,452	420,000	700,000	2,500,000	2.2
Oats	40,000	60,000	100,000	500,000	2.5
Vines *	18,500	16,868	494,820	.....	..

* Yield in hectolitres of wine.

COMMERCE. By decree dated Aug. 1, 1914, the export of cereals and their by-products and of all other flour foodstuffs and grain of every kind has been prohibited since August 2nd. Exceptions may be authorized. By a decree of November 16th the export of cotton and cotton waste has been prohibited.

The export of wheat to France has been authorized without restriction, for oats up to 250,000 metric quintals, and for barley up to 500,000 quintals. The export of barley has also been permitted to Great Britain and Ireland for a quantity not superior to 250,000 quintals.

By countries of origin and destination, the trade for 1913 is given below in thousands of francs:

	Imports	Exports
France	76,215	73,110
Algeria	14,069	8,309
United Kingdom	14,899	15,589
Germany	3,209	7,207
Austria-Hungary	2,543	2,039
Belgium	2,376	9,814
Italy	9,129	25,815
Malta	243	2,628
Spain	1,052	3,910
Portugal	62	1,112
Sweden	1,039	442
Switzerland	2,207	7
Netherlands	223	6,595
Turkey	1,270	182
Egypt	953	2,825
Tripoli	555	12,174
United States	7,117	279
Brazil	1,557	1

	Imports	Exports
Argentina	1,875	.....
Other	4,151	7,680
Total 1913	144,254	178,663
Total 1912	156,294	154,655
Total 1911	121,683	143,681

Leading exports in 1913—cereals, 24,832,000 francs; phosphates, 47,755,000; lead, 8,788,000; iron, 6,393,000; zinc ore, 5,265,000; esparto, 4,201,000; wine, 5,341,000; olive oil, 20,552,000; woolens, 3,129,000; animals, 9,104,000; fish, 1,903,000; skins, 2,130,000; sponges, 3,350,000.

COMMUNICATIONS. Railways (1910), 1532 kilometers; extensions are projected. Telegraph lines, 4630 kilometers; wires, 16,004.

FINANCE AND GOVERNMENT. The 1913 budget estimated the revenue at 85,012,400 francs and the expenditure at 85,002,322.

By the treaty of 1881, French control over Tunis is to obtain until the local government is declared by both sides entirely capable of orderly administration. A French resident-general governs the country under the direction of the foreign office. The reigning Bey (Sidi-Mohammed en Nasser) receives an annuity of 940,000 francs; in addition, 750,000 francs are granted to the royal princes.

TUNNELS. This subject was one of the leading topics at the International Engineering Congress held at San Francisco, Sept. 20 to 25, 1915, in connection with the Panama-Pacific Exposition. At the sessions devoted to railway engineering several important papers on tunnels and tunnel construction were presented. Charles S. Churchill, of the Norfolk and Western, described the most important tunnels under construction or recently completed in America in a paper that discussed such works as the Snoqualmie tunnel of the Chicago, Milwaukee, and St. Paul, a single track tunnel 11,890 feet in length, in the Cascade Mountains, completed in January, 1915; the Sandy Ridge tunnel of the Elkhorn extension of the Carolina, Clinchfield, and Ohio, a single track tunnel, 7804 feet in length; the double-track Nicholson tunnel, 3630 feet long, on the change of line of the Delaware, Lackawanna, and Western; the Mount Royal tunnel in Montreal; and the Seattle tunnel, and the Rogers Pass tunnel, in the Selkirks Mountains, Canada. Prof. Dr. Luigi Luiggi, of Rome, Italy, read a paper on "Tunnels Recently Completed in Italy," which discussed modern construction in that country. R. Winkler, director of the technical division of the Swiss Railway Department, Berne, discussed "The Railway Tunnels in Switzerland," stating that on Jan. 1, 1915, there were 627 tunnels with a total length of 175.01 miles in operation or under construction. This paper dealt particularly with tunnels of more than 6560 feet in length, and detailed the conditions affecting important constructions in the previous 10 years.

An interesting discussion of soft ground tunneling, since first used under the Thames River in 1828, was given in a paper read during the year before the Municipal Engineers of the city of New York by Howard B. Gates. This paper, abstracted in the *Engineering Record*, vol. lxxiii, No. 1, shows the interesting development from early days until the construction of the Hudson tubes in 1902, and the prosecution of tunnels in connection with the construction of the New York subways.

ROGERS PASS TUNNEL. The longest tunnel in North America was the five-mile double-track tunnel of the Canadian Pacific Railway at the Rogers Pass summit of the Rocky Mountains, between Glacier and Field, B. C. In the calendar year 1915, 3.5 miles of heading, and 2.8 miles of double-track tunnel enlargement were completed, so that the headings met on December 19th, breaking the American record for tunnel construction, while at the end of the year the rate of progress on the double-track enlargement averaged somewhat in excess of 50 feet per day. In this tunnel, as discussed in the *YEAR BOOK* for 1914, new methods were adopted; namely, a pioneer tunnel was driven from each end parallel with but distinct from the main tunnel, and cross cuts were run to the line of the main tunnel. This method was employed as it was impossible to use vertical shafts or even adits such as would be employed with a side hill tunnel. An interesting paper on this work was published in *Engineering News*, vol. lxxiv, No. 20, Nov. 11, 1915.

MOUNT ROYAL TUNNEL. This tunnel, which gives access for the Canadian Northern Railway into the business section of Montreal, was nearing completion at the end of the year. It is 3.1 miles long, and leads to a proposed passenger terminal to be located immediately adjacent to its east portal, between Mansfield and St. Monique Streets, and Cathcart and Laguachetiere Streets, in the main shopping district of the city, the tracks at the station being 50 feet below the level of the street, and most of the station proper under ground. The tunnel is designed for operating all trains electrically, and is built for double track, being 23.5 feet high, 31 feet wide. It is located almost entirely in rock, and the construction was carried on by the use of the most improved tunneling methods. Centre bottom headings were employed, and as soon as these were pushed forward cars were run so as to remove the muck and broken stone, the latter being crushed for rock material and concrete.

PENNSYLVANIA RAILROAD. During the year the Pennsylvania Railroad was completing some heavy realignment work on the Allegheny Division, which involved the construction of three tunnels with a combined length of 8703 feet, and would produce a saving of 12.32 miles. These tunnels were located at East Brady—2468 feet long; at Wood Hill—2730 feet long; and at Kennerdell—3505 feet long. The East Brady tunnel, while the shortest of the three, cuts off 5.36 miles of line, and was notable for the difficulties encountered with falling rock. The heading was holed through during the year, and in December was rapidly reaching completion.

THE TWIN PEAKS TUNNEL, which had been under construction in San Francisco since Nov. 30, 1914, showed progress during the year. The length of this tunnel was 12,000 feet; width, 25 feet in the clear; and a clear height above top of rail of 15 feet. It is on the line of Market Street, and was said to be the largest project of the kind ever undertaken in any city for the extension of a street railway system. Up to the end of the year, over 2000 feet had been excavated westerly from the east portal, and this had been followed by a concrete lining.

CHICAGO was building a new intake tunnel for water supply extending 3 miles under the lake to an intake crib, and 5 miles under the city to

a pumping station. This tunnel was of horse-shoe section, 13 feet wide and 12 feet high, and within solid rock for the entire distance. It was to supply a pumping station of 100,000,000 gallons per day capacity.

NEW YORK TUNNELS. During the year 1915 eight tunnels, seven of them double-tube, were in actual use or building, to connect Long Island with the west bank of the East River at New York City. The tunnels were the existing subway tubes, the Whitehall-Montague Street tunnels, the Old Slip-Clark Street tunnels, the Fourteenth Street-Eastern tunnels, the Pennsylvania tunnels, the Queensboro or Steinway tunnels, the Sixteenth Street tunnels, and the Consolidated Gas Company's Astoria tunnel. Naturally such work was well understood and construction progressed rapidly and for the most part without incident. On November 30th a blowout occurred in the south tunnel, west end, of the pair of tunnels under the East River from Old Slip, and filled the tube with water at the shield. Work was stopped until a clay cover could be placed on the river bottom to seal the disturbed ground. The accident was due to a leak in the river bottom developing with the giving way of the earth face at the top of the excavating shield just after a blast had been fired in the rock portion beneath. Attempts to block the leak with bag sawdust were unsuccessful, and the shield became submerged, the upper part of the tunnel still holding compressed air. See *RAPID TRANSIT*.

BOSTON. A novel feature in the construction of the Dorchester tunnels in Boston was the use of belt conveyors to carry the clay spoil from the shields back to the muck cars, so that driving, water-proofing and lining the tunnels could proceed simultaneously. The Dorchester tunnels, which were under construction during the year, extend under Winter and Summer Streets, under Fort Point Channel and Dorchester Avenue to Andrew Square, Dorchester, a total length of a little more than 2 miles. See *RAPID TRANSIT*.

FURKA TUNNEL. In September, 1915, the Furka tunnel, which had been under construction for a number of years, was holed through after a series of vicissitudes during construction. This tunnel extends under the Furka Pass and is a part of the Furka Railway leading from Brig, in the valley of the Upper Rhône, to Andermatt, on the Upper Reuss, and to Disentis, in the valley of the Vorder Rhine, where it joins the Rhetian Railway, and makes other connections. The Rhône Valley section, from Brig to Gletsch, was opened in June, 1914, but the outbreak of the war delayed operations, though the railway was entirely in Swiss territory. The tunnel begins at the 2124 meter (6968 feet) level in the Gratschlucht section of the Muttbach, and proceeds under the Furka Pass about 200 meters (656 feet) south of the Furka Hotel, emerging in the valley of the Furka-Reuss at an elevation of 2170 meters (7120 feet). Construction was carried on from both ends and the material pierced was such that it was necessary to brick up the top and bottom arches as the work in the tunnel advanced on the shaft starting from the western side. On the eastern side construction was less difficult, and the work proceeded regularly, although there were a large number of accidents during the work. The Furka Railway was to be operated both by adhesion and rack systems, and a portion of the

new line was opened during the year. The construction was criticised on the score that sufficient attention had not been paid to geological conditions.

SIMPLON. The second Simplon tunnel was half completed at the end of October, 1915. The respective lengths of completed tunnel at the north and south ends were 19,431 feet (5924 meters) and 16,242 feet (4952 meters), a total of 35,673 feet (10,876 meters). The work was very seriously interfered with by continual change in the workmen on account of the draft of Italian laborers for the army.

MONT D'OR TUNNEL. This important tunnel through the Jura Mountains was opened to traffic on May 15th, completing the new direct line for the Paris-Lyons-Mediterranean Railway to the Simplon tunnel route to Italy. This tunnel is 3½ miles in length, and was under construction from Nov. 14, 1910, being attended by considerable difficulty due to intruding water. It has a double track line laid with 96-pound T-rails on creosoted oak ties, and the trains were to be drawn by steam locomotives, which was possible on account of the good ventilation of the tunnel.

MARSEILLES CANAL TUNNEL. In the *Professional Memoirs of the Corps of Engineers*, May-June, 1915, E. L. Corthell describes the largest tunnel in the world, which was being built at Marseilles, France, for the Marseilles-Rhône Canal. The total length when completed was to be about 4 miles, and the total volume of excavation was estimated at a greater amount than that for any tunnel for traffic purposes ever constructed. The tunnel is to form a part of a canal somewhat less than 50 miles in length, built to bring commerce from the Rhône River, from Lyons and above, direct to Marseilles. The tunnel, which is lined throughout its length, is 72.2 feet wide inside the lining, and the crown of the arch, which is nearly semi-circular, is 32½ feet high. The depth of water in the canal was to be 10 feet. The method of construction was to excavate a heading first on the left at the base, 9.8 feet by 10.7 feet, and then follow it by a similar heading on the right side, at the same level. A small heading at the top of the arch was then carried, and the two side headings were enlarged towards the centre and to connect with the top heading. On account of the war, work was suspended on this as on other tunnels in Europe, during 1915, but the project was well under way. Some doubt, however, was expressed whether it would ever be completed on account of the vast expense, as the cost of the European war was greatly diminishing the probability of funds being available for many years for engineering works. Furthermore, in this section of France traffic by river barges was diminishing to a considerable extent.

BAGDAD RAILWAY. One of the construction features on the Bagdad Railway (see **TURKEY, Communications**) was the completion of a 3-mile tunnel piercing the Amanus Mountains on the border between Asia Minor and Syria. This tunnel, known as the Baghtché tunnel, is about 75 miles east of Adana and 60 miles northwest of Aleppo, and is 18,028 feet in length, with a summit in the middle 246 feet higher than the lower portal.

TUPPER, SIR CHARLES. A Canadian statesman, died Oct. 30, 1915. He was born in Amherst, N. S., in 1821, and was educated at the

University of Edinburgh, receiving his degree in 1843. He removed to Canada, and in 1855 began his public career as a member of the Assembly of Nova Scotia. He became provincial secretary and in 1864 was made premier of Nova Scotia. When the Dominion of Canada was formed he was recognized as one of the most prominent figures. He was minister of customs in Sir John Macdonald's cabinet, which resigned in 1873 as a result of the Pacific scandal. Five years later he became minister of public works, created the department of railways and canals, and was its first minister. During his term of office many notable improvements were made in the public works of Canada. He directed the enlargement of the Welland Canal, the deepening of the channel of the St. Lawrence, and the improvement of the Intercolonial Railway, and supervised the construction of the Canadian Pacific Railway. He retired from the ministry in 1884, and went to London as high commissioner for the Dominion of Canada. Three years later he returned to Canada and reentered the Macdonald cabinet, as minister of finance. He resigned within the year, however, and resumed the post of high commissioner. In 1896 he became secretary of state, and leader of the House of Commons, and on the retirement of Sir MacKenzie Bowell succeeded to the premiership of the Dominion. With the defeat of his party in the election of 1896, Sir Charles was chosen leader of the Opposition. He filled this post until after the general election of 1900, when his party again suffered another defeat. He then retired permanently from public life at the age of 79. He served for many years as president of the American Medical Association.

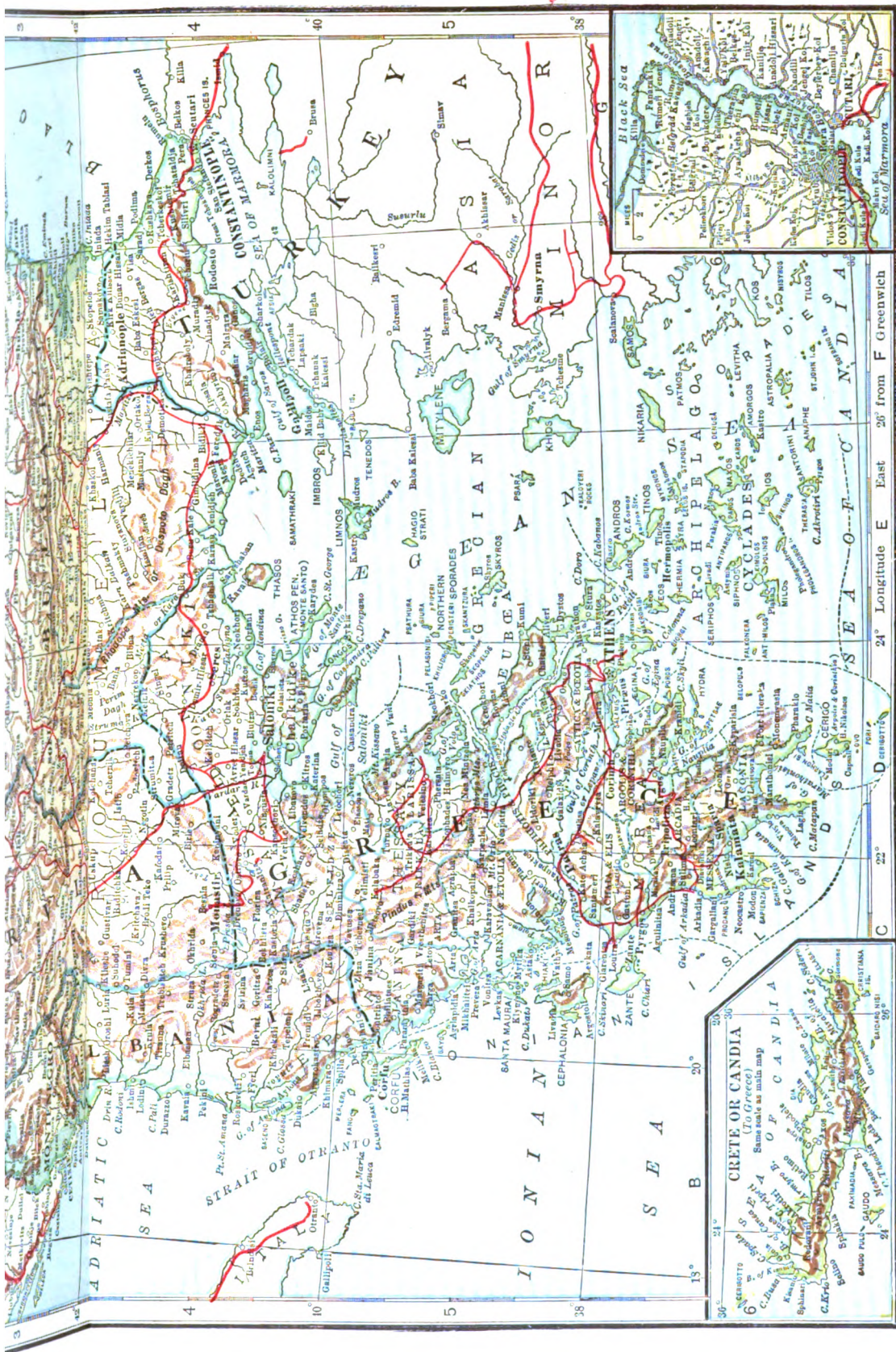
TURBINES. See **STEAM TURBINES**.

TURKEY, or the OTTOMAN EMPIRE. A monarchy in southeastern Europe and southwestern Asia. Capital, Constantinople.

AREA AND POPULATION. Out of the former European area of 169,300 square kilometers, or 65,367 square miles, carrying a population estimated at 6,130,200, Turkey retains only 26,100 square kilometers, or 10,882 square miles, with 1,891,000 inhabitants (Constantinople vilayet, 1505 square miles and 1,203,000 inhabitants; Chatalja mutessarifat, 733 and 78,000; Adrianople vilayet, 8644 and 610,000). Mohammedans preponderate in this territory. The city of Constantinople has 942,900 (with suburbs 1,200,000) inhabitants; Adrianople has 123,000. The great divisions of Turkey in Asia are Asia Minor, Armenia and Kurdistan, Syria and Mesopotamia, and Arabia. Their total area and estimated population by vilayets and mutessarifats are shown in the table below, with density per square kilometer:

	Sq. km.	Pop.	D.
Archipelago	6,900	322,300	54
Ismid *	8,100	222,700	39
Bigha *	6,600	129,500	26
Brussa	65,800	1,626,800	26
Smyrna	55,900	1,396,500	34
Konia	102,100	1,069,000	13
Adana	39,900	422,400	12
Angora	70,900	932,800	16
Kastamuni	50,700	961,200	21
Sivas	62,100	1,057,500	19
Trebizond	32,400	948,500	44
Total Asia Minor	501,400	9,089,200	21
Erzerum	49,700	645,700	16
Manuret-ul-Aziz	32,900	575,200	14
Bitlis	27,100	398,700	15





	Sq. km.	Pop.	D.
Diarbekr	87,500	471,500	11
Van	89,800	379,800	7
Total Armenia and Kurd.	186,500	2,470,900	13
Aleppo	86,600	995,800	11
Beirut	16,000	538,500	45
Lebanon *	8,100	200,000	161
Jerusalem *	17,100	341,600	22
Syria	95,900	719,500	9
Zor *	78,000	100,000	1
Bagdad	111,300	614,000	4
Mosul	91,000	351,200	3
Busra	138,800	433,000	3
Total Syria and Mes.	637,800	4,288,600	8
Hejaz	250,000	800,000	1
Yemen	191,100	750,000	4
Total Arabia	441,100	1,050,000	8
* Mutesarrifat.			

Asir, Nejd, and El Hasa and El Katr, in Arabia, are regarded as belonging to Turkey, but are inhabited by tribes whose subjection is merely nominal. Albania, lost to Turkey at the end of the Balkan Wars, is a name given to an indeterminate area embracing the old vilayets of Scutari and Janina, with portions of Kossovo and Monastir; Macedonia comprehends the old vilayet of Salonica, the eastern (and larger) part of Monastir, and southeastern Kossovo. Turks in all parts of what was once the empire, are estimated to number about 11,000,000; Greeks, Arabs, Albanians, Bulgarians, Serbians, Vlachs, Kurds, Armenians, Jews, Syrians, Circassians, and other races are scattered over the country. Reliable population figures are unobtainable—the 11,000,000 Turks being merely a guess. Mohammedans form the majority of the population. Christians (Orthodox) predominate in some districts, notably in Macedonia, and Gregorians in Armenia. There are also Roman Catholics, Nestorians, etc.

Public education, in the Western sense, is almost unknown, except in non-Moslem institutions. Moslem instruction, theoretically obligatory and in all cases free, is confined mainly to the reading of the Koran and is largely in the hands of the priests.

The population of the larger cities, besides Constantinople, has been estimated as follows: Damascus, 250,000; Smyrna, 250,000; Aleppo, 200,000; Beirut, 140,000; Bagdad, 125,000; Erzerum, 120,000; Afium, 95,000; Manissa, 90,000; Jerusalem, 84,000; Aidin, 80,000; Brussa, 80,000; Diarbekr, 80,000; Mosul, 80,000; Sivas, 78,000; Urfa, 72,000; Aintab, 70,000; Mecca, 70,000; Busra, 60,000; Trebizond, 60,000; Adana, 50,000; Homs, 50,000; Hodeida, 49,000; Angora, 38,000; Gaza, 30,000.

The inhabitants of Asiatic Turkey are in part sedentary, in part nomad; in part Mohammedan, in part Christian. The majority depend upon agriculture or grazing for their livelihood. The manufactures are mainly for home consumption. There are valuable deposits of minerals.

Following are the statistics of production (1910) in "29 provinces and districts": 44,845,000 quintals of wheat, 4,773,000 of rye, 29,005,000 of barley, 4,478,000 of oats, 11,246,000 of corn, 1,019,000 of rice. Cotton, tobacco, opium, and other crops are raised; olive oil, wool, and mohair are valuable exports; rugs are manufactured.

COMMERCE. Trade statistics are incomplete. A reliable German source gives as the latest

available trade figures, 4,012,574,000 piasters imports, and 2,193,789,000 piasters exports for the year ended Feb. 28, 1911. It would be idle to enter into details for so remote a year, especially as these details were given in the previous YEAR BOOK. From another source not so reliable we quote trade figures for 1912: \$217,755,000 imports and \$119,606,500 exports; imports from United States in 1914, \$3,328,519, and exports to United States, \$20,843,077.

COMMUNICATIONS. Railways, including the lines in the lost provinces, were reported in 1914 to be 4230 miles, divided as to ownership as follows: Hejaz line (1000 miles), Turkish; Salonica-Constantinople (320), Smyrna-Kassaba (330), Syrian (370), Jaffa-Jerusalem (60)—all French lines; Salonica-Monastir (140), Anatolian (to Angora, 360; to Konoa, 300; to Adabazar, 50), Bagdad-Bulgurli (130), Mersina-Adana (50)—all German; Oriental railways (800), Austro-German; Smyrna-Aidin (320), British.

The Bagdad Railway, according to the plans for its construction being followed in 1915, was to extend from Konieh, in the Province of Konieh in Asia Minor, southeast of Constantinople, through Aleppo, Mesopotamia, and Bagdad to Busra, near the mouth of the Euphrates and Tigris rivers, a total distance of something like 1314 miles. Construction work, however, was carried on in disconnected sections. By the early part of 1915 there had been about 175 miles of line constructed to the west of the Cilician Taurus, about 105 miles (including a branch line about 36 miles long) in the plain from Adana, about 158 miles between the Amanus Mountains and the Euphrates, and 79 miles in the neighborhood of Bagdad. In addition to this there was a small branch line, 40 miles long, from Adana to Mersina, which the Bagdad company had acquired, and which until the opening of the port of Alexandretta for the Asia Minor portions of the Bagdad Railway, represents the only access to the sea. This made an aggregate of 556 miles of the Bagdad Railway opened for traffic by 1915. Owing to military considerations, the work was being pushed with energy. The sections that were being rushed to completion were directly associated with the military advantages that would be obtained with direct railway connection from the Bosphorus to the Egyptian frontier. During 1915 there was completed the large tunnel on the Bagdad Railway piercing the Amanus Mountains, on the border between Asia Minor and Syria. It is known as the Baghtché tunnel, taking its name from the station of Baghtché, at its northern entrance, about 75 miles east of the city of Adana and some 60 miles northwest of Aleppo. It has a length of 16,028 feet. Another important section of the line on which work was being prosecuted was the 24-mile section through the Taurus Mountains, which includes about 70 tunnels, viaducts, and other engineering works. Under normal conditions the completion of this section would have been looked for in 1916. The continuation line from Bagdad had been built north to Tekrif, 90 miles.

During the year it was reported that Meissner Pasha, the German engineer who built the Hedjaz Railway, had been entrusted by the Turkish government with the construction of a new strategic line for use in connection with a second attack on Egypt. In May, 1915, this railway

was said to have reached Lydda, on the Jaffa-Jerusalem line. Rapid construction was possible by removing tracks already laid on other railways, and 270 miles of track intended for the Medina-Mecca section of the Hedjaz Railway had been taken for the construction of the new line.

The extension of the Syrian Railway from Isilahie to Radju, which brings the completed section some 20 miles nearer the already completed tunnel at Bakdje, was opened Oct. 20, 1915. This line when completed will connect Aleppo with Alexandretta, and join the Syrian Railway with the Konia-Adana line.

It is reported that in 1913 the total tonnage of vessels entered at Constantinople was 17,397,888.

NAVY. No reliable figures can be quoted for the number and displacement of vessels composing the Turkish navy at the end of 1915, the exact damage sustained during the Balkan Wars and the War of the German Invasion being unascertainable.

FINANCE. A revenue of \$141,240,000 and an expenditure of \$150,475,000 are reported as estimated for 1914-15; but these figures cannot be relied upon. The 1912-13 budget is given below in detail:

Revenue	£ T	Expenditure	£ T
Direct taxes . . .	14,870,881	Public debt † . .	14,709,937
Ind. taxes . . .	5,692,728	War	8,948,705
Monopolies . . .	8,621,878	Administration ‡	4,166,053
Stamps, etc. . .	1,861,886	Justice, etc. § . .	1,690,104
Pensions	1,178,513	Public works . . .	1,217,521
Tribute *	898,877	Marine	1,276,000
Various	1,724,770	Posts and tels. . .	732,800
Total	80,514,159	For. affairs ¶ . . .	678,833
		Civil list	505,880
		Sheikh-ul-Islam. .	19,170
		Total	84,590,561

* Egypt, Cyprus, Mount Athos, Samoa. † And finance. ‡ Senate Chamber, council, gendarmerie, court of accounts, etc. § And worship and instruction. ¶ And agriculture, mines, and forests.

The public debt stood, Sept. 24, 1913, at £T211,146,852. The piaster, worth about 4.4 cents, is the unit of value, 100 piasters being equal to 1 pound Turkish.

GOVERNMENT. Both temporal and spiritual authority rest with the Sultan, who appoints a grand vizier to form a cabinet. A Senate and a Chamber of Deputies constitute the legislative body. At the head of ecclesiastical affairs is the Sheikh-ul-Islam, under the direction of the Sultan. Reigning sovereign, Mohammed V, born 1844, brother of the deposed Abdul Hamid, whom he succeeded April 27, 1909.

HISTORY

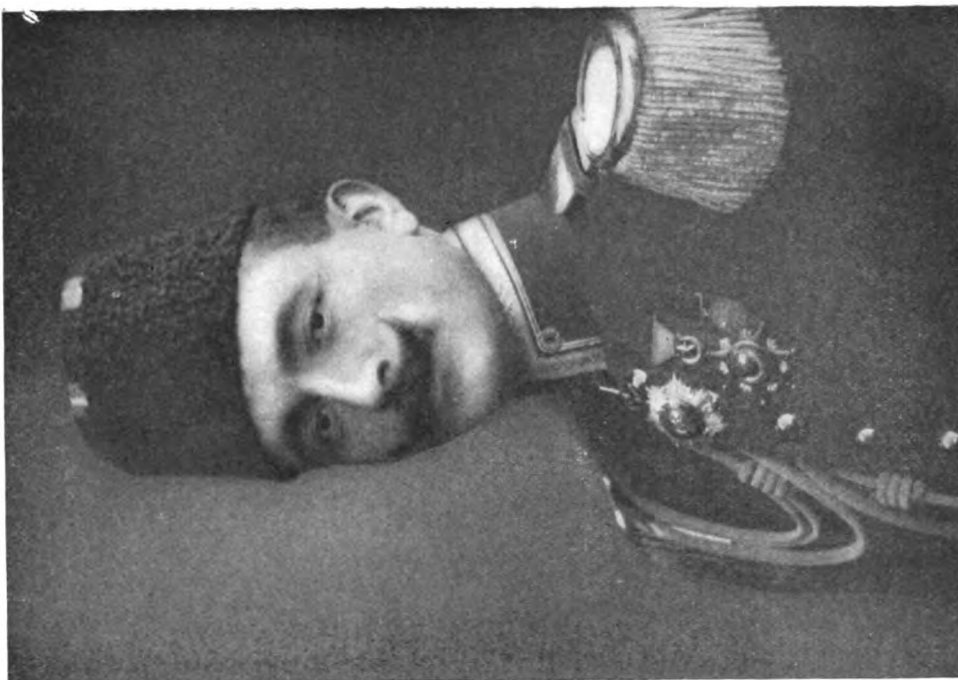
INTERNAL CONDITIONS. Internal conditions in the Ottoman Empire during the war were the subject of the most confused and contradictory reports. Through the press agencies of the Entente Powers came sensational descriptions of uprisings in Constantinople, of mutinies in the Turkish army, of insurrections in Asiatic Turkey, of declarations by high personages in favor of an immediate and inglorious peace. In the nations of the Triple Entente, Enver Bey, the leading spirit in the Young Turk cabinet, was regarded as an unscrupulous and reckless political adventurer with no real popular support; Enver Bey's war policy was considered to be

hostile to the wishes and fatal to the true interests of the Turkish nation; and the German officers in the Turkish army were said to be the object of bitter dislike. Ex-Sultan Abdul Hamid was quoted in February as advising Turkey to conclude a separate peace; later, he was reported to have been removed into the interior of Asia Minor by order of the Young Turk ministers, who feared that he would instigate a revolution in Constantinople. In April, von der Goltz and Halil Bey were represented as having personally visited Berlin to plead for the dispatch of a German army to the relief of Turkey. According to another story, published in *Le Temps*, of Paris, Enver Pasha and Talaat Bey bitterly complained to Marshal von der Goltz, as Germany's military representative in Turkey, respecting Germany's heartless indifference to the fate of Constantinople. From German and Austrian sources, on the other hand, it appeared that public sentiment in Turkey was not at all perturbed by the Allied operations in the Dardanelles. In April the *Neue Freie Presse* quoted Field Marshal von der Goltz to the effect that Constantinople was perfectly confident in the ability of the Turkish army, with the advantage of the impregnable Dardanelles fortifications, to ward off the Anglo-French attacks. Over 1,250,000 well-trained soldiers were available for the defense of Turkey, according to the German field marshal's statement. The German press also laid great stress upon the speech which Halil Bey, president of the Turkish Chamber of Deputies, delivered at the close of the parliamentary session. Reviewing the events of the war, Halil Bey asserted that Turkey and her allies had won a series of glorious victories; he pointed with pride to the fact that Turkey was able to take the offensive against the British in the region of the Suez Canal; he proudly boasted that the Ottoman army was helping to defend Berlin, Vienna, and Budapest at the same time as Constantinople; and as for the statement so persistently emphasized by Turkey's enemies, that the Triple Entente would have been willing to guarantee the territorial integrity of Turkey on condition of Turkey's remaining neutral, Halil Bey scornfully exclaimed, "To those who wish to see an example of a country whose territorial inviolability was guaranteed by Russia and England, I will point to Persia." Halil Bey later became Turkish minister of foreign affairs, October 24th, and was succeeded by Hadj Alil Bey as president of the Chamber of Deputies.

THE SPEECH FROM THE THRONE. In November the Turkish Parliament was convened at Constantinople. The speech from the throne, opening the new session, was characterized by the most unmistakable confidence on the part of the Turkish government. "The violent attacks," it was asserted in the speech, "which have been directed against the Dardanelles and Gallipoli by the land and sea forces of Great Britain and France with the hope of invading Constantinople and capturing the straits, an object for which the Russians for the last two and a half centuries had striven in vain, have been repulsed by the devoted and enthusiastic resistance of my army and my navy. The army and the navy have added new glory to the illustrious deeds of our ancestors, and have won the respect of all nations. . . . After the brave armies of our glorious allies had captured the fortresses and destroyed the strength of the Russian army, and



FIELD MARSHAL VON DER GOLTZ
 Commander First Turkish Army



ENVER PASHA
 Turkish Minister of War

MILITARY LEADERS OF TURKEY

service of the United States. (See CIVIL SERVICE.) This bill passed the Senate on February 19th.

An attempt was made in the Senate, in the last days of the session, to bring about the limitation of debate. The Committee on Rules, however, on February 12th, reported adversely. On March 2nd, 41 Democratic Senators asked for the appointment of a committee of five Senators to report on a revision of the Senate rules of debate at the next session. The failure of the Shipping Bill and other measures, due largely to filibustering tactics by their opponents, was the cause of the agitation regarding the rules of debate in the Senate.

Post Office and the Indian Supply bills were among bills, introduced later, that failed of passage.

Sixty-fourth Congress. At a caucus held on Feb. 5, 1915, the Democrats in the House renominated Champ Clark speaker, and chose Claude Kitchin of North Carolina chairman of the Ways and Means Committee and majority leader to succeed Oscar Underwood, who had been elected to the Senate in 1914. The Sixty-fourth Congress convened on Dec. 6, 1915. During the first week over 2000 bills were introduced. President Wilson, on December 7th, read his address. The outstanding features were the necessity of military and naval preparedness, the recommendation of laws for the prosecution of plotters against neutrality, and the proclamation of the doctrine of Pan-Americanism.

The following list gives the names of the Senators and Representatives in the Sixty-fourth Congress. The year of expiration of the term of service of Senators is indicated.

[Democrats in roman; Republicans in *italics*; Progressives in SMALL CAPS; Progressive Republicans in *italics* with *; Independent in CAPS; Prohibitionist in roman with *; Socialist in black letter; Progressive Protectionist in SMALL CAPS with *.]

ALABAMA.—SENATORS: †John H. Bankhead, †Oscar W. Underwood. REPRESENTATIVES (Democrats, 10): At large, John W. Abercrombie; Oscar L. Gray, S. Hubert Dent, jr., Henry B. Steagall, Fred L. Blackmon, J. Thomas Hedin, William B. Oliver, John L. Burnett, Edward B. Almon, George Huddleston.

ARIZONA.—SENATORS: * Henry F. Ashurst, † Marcus A. Smith. REPRESENTATIVE: (Democrat, 1): At large, Carl Hayden.

ARKANSAS.—SENATORS: †James P. Clarke, †Joseph T. Robinson. REPRESENTATIVES: (Democrats, 7): Thaddeus H. Baraway, William A. Oldfield, John N. Tillman, Otis Wingo, Henderson M. Jacoway, Samuel M. Taylor, William S. Goodwin.

CALIFORNIA.—SENATORS: * John D. Works, † James D. Phelan. REPRESENTATIVES (Democrats, 8; Republicans, 3; Progressives, 2; Progressive Republican, 1; Independent, 1; Prohibitionist, 1): WILLIAM KENT, John E. Raker, Charles F. Curry, Julius Kahn, JOHN I. NOLAN, JOHN A. ELSTON, Denver S. Church, Everts A. Hayes, Charles H. Randall,* William D. Stephens,* William Kettner.

COLORADO.—SENATORS: †Charles S. Thomas, †John F. Shafroth. REPRESENTATIVES (Democrats, 3; Republican, 1): Benjamin C. Hilliard, Charles B. Timberlake, Edward Keating, Edward T. Taylor.

CONNECTICUT.—SENATORS: †Frank B. Brandegee, * George P. McLean. REPRESENTATIVES (Republicans, 5): P. Davis Oakley, Richard P. Freeman, John Q. Tilson, Ebenezer J. Hill, James P. Glynn.

DELAWARE.—SENATORS: * Henry A. duPont, † Willard Saulsbury. REPRESENTATIVE (Republican, 1): At large, Thomas W. Miller.

FLORIDA.—SENATORS: †Duncan U. Fletcher, * Nathan P. Bryan. REPRESENTATIVES (Democrats, 4): Stephen M. Sparkman, Frank Clark, Emmett Wilson, William J. Sears.

GEORGIA.—SENATORS: †Hoke Smith, †Thomas W. Hardwick. REPRESENTATIVES (Democrats, 12): Charles G. Edwards, Frank Park, Charles R. Crisp, William C. Adamson, William S. Howard, James W.

Wise, Gordon Lee, Samuel J. Tribble, Thomas M. Bell, Carl Vinson, J. Randall Walker, Dudley M. Hughes.

IDAHO.—SENATORS: †William E. Borah, †James H. Brady. REPRESENTATIVES (Republicans, 2): At large, Robert M. McCracken, Addison T. Smith.

ILLINOIS.—SENATORS: †Jas. Hamilton Lewis, †Lawrence Y. Sherman. REPRESENTATIVES (Democrats, 10; Republicans, 16; Progressive Republican, 1): At large, Burnett M. Chisepfield, Wm. Elia Williams, Martin B. Madden, James E. Mann, William W. Wilson, James T. McDermott, Adolph J. Sabath, James McAndrews, Frank Buchanan, Thomas Gallagher, Fred A. Britten, George E. Foss, Ira C. Copley,* Charles E. Fuller, John C. McKenzie, Clyde H. Tavenner, Edward J. King, Claudius U. Stone, John A. Sterling, Joseph G. Cannon, William B. McKinley, Henry T. Rainey, Loren E. Wheeler, William A. Rodenberg, Martin D. Foster, Thomas S. Williams, Edward E. Denison.

INDIANA.—SENATORS: †Benjamin F. Shively, * John W. Kern. REPRESENTATIVES (Democrats, 11; Republicans, 2): Charles Lieb, William A. Cullop, William E. Cox, Lincoln Dixon, Ralph W. Moss, Finly H. Gray, Merrill Moores, John A. M. Adair, Martin A. Morrison, William E. Wood, George W. Rauch, Cyrus Cline, Henry A. Barnhart.

IOWA.—SENATORS: †Albert B. Cummins, †William S. Kenyon. REPRESENTATIVES (Democrat, 1; Republicans, 10): Charles A. Kennedy, Harry E. Hull, Burton E. Sweet, Gilbert N. Haugen, James W. Good, C. William Ramseyer, Cassius C. Dowell, Horace M. Townner, William E. Green, Frank P. Woods, T. J. Steele.

KANSAS.—SENATORS: †William H. Thompson, †Charles Curtis. REPRESENTATIVES (Democrats, 6; Republicans, 2): Daniel E. Anthony, jr., Joseph Taggart, Philip P. Campbell, Dudley Doolittle, Guy T. Helvering, John R. Connelly, Jonett Shouse, William A. Ayres.

KENTUCKY.—SENATORS: †Ollie M. James, †J. C. W. Beckham. REPRESENTATIVES: (Democrats, 9; Republicans, 2): Alben W. Barkley, David H. Kincheloe, Robert Y. Thomas, jr., Ben Johnson, Swagar Sherley, Arthur B. Rouse, J. Campbell Cantrell, Harvey Helm, William J. Fields, John W. Langley, Caleb Powers.

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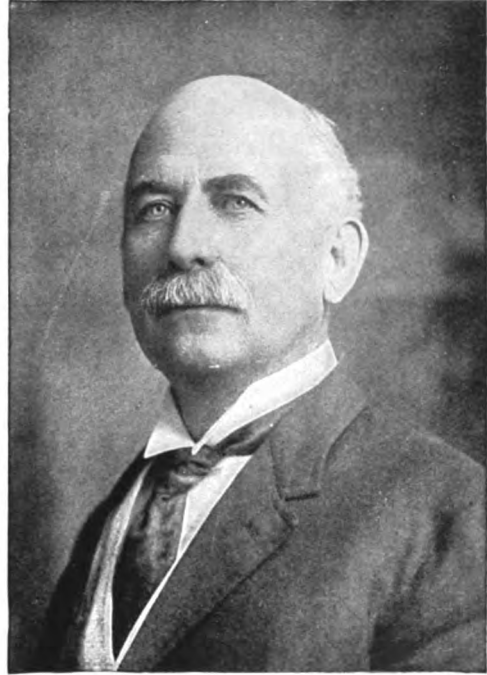
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* Term expires 1917. † Term expires 1919. † Term expires 1921.



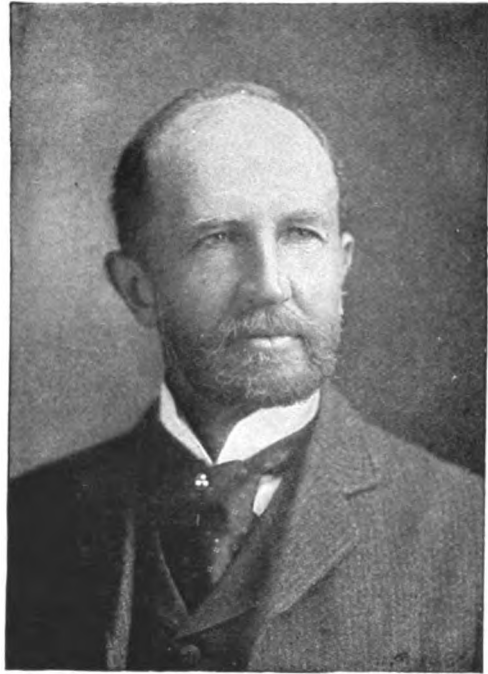
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FOUR REPRESENTATIVES PROMINENT IN 1915

neutral countries. Shortly after the outbreak of hostilities, Great Britain began detaining American ships bound for neutral ports on the ground that their cargoes were destined for the enemy. For some months the United States government did not protest, hoping that Great Britain would modify her policy. Finally on Dec. 28, 1914, the United States addressed a communication to Great Britain calling attention to the interference by the latter with American commerce with neutral nations, on the ground that goods so consigned might reach the enemies of Great Britain. In this connection the note stated that "mere suspicion was not evidence, and doubts should be resolved in favor of neutral commerce, not against it." To this note Great Britain replied on Jan. 7, 1915, that that country had not aimed to interfere with the "bona-fide" trade of the United States with neutral countries, but figures were given showing the marked increase in exports of such articles as rubber and copper from the United States to neutral countries contiguous to Germany. It was stated that with such figures the presumption was very strong that such goods were ultimately destined for a belligerent country. The note further stated that Great Britain was prepared to admit that foodstuffs should not be seized without the presumption that they were intended for the armed forces of the enemy. In regard to the placing of cotton on the list of contraband it was stated that the British government had not contemplated any such action. In conclusion the British government agreed to make reparation for any injury improperly done to neutral shipping.

A novel question arose due to the action of the German government in placing under government control all of the food supply of the Empire. The British government declared that it would be impossible to distinguish between food intended for the civilian population of Germany and food to be used by the German military forces. In view of this situation the British government stated that foodstuffs intended for consumption in Germany would be considered contraband. A test case was made with the steamship *Wilhelmina*, which reached England Feb. 9, 1915, from the United States, loaded with grain for Germany. She was placed in the Prize Court, and on April 13, 1915, the British government announced that it had agreed to purchase the cargo of the *Wilhelmina* and to compensate the owner for loss. This offer was accepted.

For some months after the outbreak of the war Great Britain hesitated to declare a blockade of German ports. This attitude was due, in part at least, to the recognized difficulty of rendering such a blockade effective in view of the geographical position of Germany, and of the activities of submarines. But events forced Great Britain to abandon her somewhat anomalous position. On March 1, 1915, Mr. Asquith, in the House of Commons, stated that Great Britain and France, in retaliation upon Germany for her declaration of the "war zone" around the British Isles (see below under *The United States and Germany*), would confiscate all goods of "presumed enemy destination, ownership, or origin." Such action, of course, could only be justified under the existing rules of international law on the presumption that a lawful blockade of German ports had been

declared. In answer to an inquiry from the American government as to whether such a blockade was contemplated, the British government stated that as an effective "cordon" controlling intercourse with Germany had been established and proclaimed, the importation and exportation of all goods to or from Germany was, under the accepted rules of blockade, prohibited. The British government further defined the "radius of activity" of the French and British fleets in enforcing the blockade as "European waters, including the Mediterranean." It was further stated that they would refrain from exercising the right to confiscate ships and cargoes for breaches of the blockade, and restrict their claim to stopping cargoes destined to or coming from the enemy's territory.

In an extended communication addressed to the British government by Secretary Bryan on March 30, 1915, attention was called to the unusual character of the proposed blockade and the interference with legitimate neutral commerce which might readily result. The United States government was willing to concede that the changed conditions of naval warfare, especially the operations of submarines, might justify some modification of the old form of "close" blockade, but it was unwilling to concede the right of belligerents to blockade neutral ports. It was further pointed out that alleged illegal acts of Germany could not be offered as an excuse for unlawful acts on the part of Great Britain. In conclusion it was stated that the German Baltic ports were open to the trade of the Scandinavian countries, although it is an essential element of blockade that it bear with equal severity upon all neutrals.

For some months the question was allowed to remain in abeyance, due to more serious questions which had arisen in connection with Germany's submarine warfare (see below, *The United States and Germany*). It was clear, however, that irritation at the continued interference by Great Britain with American commerce was constantly increasing. On Aug. 3, 1915, the State Department at Washington published five diplomatic communications which had been exchanged between the two governments relating to the detention of American ships and cargoes. In response to the American note of March 30, 1915, on the subject of the restrictions imposed on American commerce by the British Orders in Council, Sir Edward Grey defended the Orders on the ground that it was necessary for Great Britain and her allies to take every step in their power to overcome their common enemy in view of the shocking violation of the recognized rules and principles of civilized warfare of which she had been guilty during the war. He further denied that the Orders in Council violated any fundamental principle of international law by applying a blockade in such a way as to cut off the enemy's commerce through neutral ports, "if the circumstances render such an application of the principles of blockade the only means of making it effective." It was contended that the only question that can arise in regard to the new character of blockade is whether the measures taken conform to "the spirit and principles of the essence of the rules of war," as stated in the American note of March 30, 1915. Sir Edward Grey contended that there was precedent for the British policy in the position taken by the United States dur-

ing the Civil War. In order to prevent contraband being shipped from neighboring neutral territory to the Confederacy, the Federal government enforced the doctrine of the continuous voyage, and goods destined for enemy territory were intercepted before they reached the neutral ports from which they were to be reexported. Such action, moreover, was upheld by the Supreme Court of the United States in the case of the *Springbok*. The main argument of the British government was that, when the underlying principles governing blockade and contraband are not violated, it is permissible to adopt new measures of enforcement.

The final chapter of the year in this controversy was written with the dispatch on Oct. 21, 1915, of an exhaustive reply by the United States to the contention of Sir Edward Grey. It was couched in much more vigorous language than the earlier communications. It stated that the so-called blockade instituted by the Allies was "ineffective, illegal, and indefensible," that the "American government cannot submit to a curtailment of its neutral rights," and that the United States "must insist that the relations between it and His Majesty's government be governed, not by a policy of expediency, but by those established rules of international conduct to which Great Britain in the past has held the United States to account."

Use of Neutral Flags. Early in the year 1915, the German government made representations to the Government of the United States that British ships were making use of neutral flags in order to escape capture. Particular attention was called to the action of the captain of the British steamer *Lusitania* in raising the United States flag when approaching British waters, and it was stated that orders had been issued by the British government to all commanders to make use of neutral flags when necessary. On Feb. 10, 1915, the United States government addressed a note to the British government calling attention to this matter. Without disputing that in exceptional cases there was precedent for the use of neutral flags by merchant vessels to escape capture, it was pointed out that any general use of the American flag for such purposes would endanger American ships, by raising the presumption that they were of belligerent nationality. In answer to this the British government stated, on Feb. 19, 1915, that English law allowed the use of the British flag by foreign merchant vessels in order to escape capture, that instances were on record of United States vessels making such use of the English flag during the American Civil War, and that it would be unreasonable to deny to British vessels at the present time a similar privilege. It was stated, however, that the British government had no intention of advising their merchant shipping to use foreign flags as a general practice.

Transfer of Belligerent Merchant Vessels to Neutral Registry. The question of the right to transfer ship ownership from a citizen of a belligerent power to a citizen of a neutral nation arose in the case of the steamer *Dacia*. This steamer, formerly owned by the Hamburg-American Line, was purchased by an American citizen after the outbreak of the war. The steamer was admitted to American registry by the United States authorities and prepared to sail with a cargo of cotton to Germany. Great Britain had

not clearly defined its position in this matter at the beginning of the war. When the question of the purchase by Americans of the interned German ships was broached, the British government indicated that it would not object to a "bona fide" transfer, if such transfer was not used for the benefit of the enemy. Thus, if the vessels were to be used in the South American trade, she would not object, but if they were to be used to trade with Germany, she would. As the *Dacia* was to be used for the latter purpose, Great Britain served notice that the vessel would be seized. A request from the United States that the *Dacia* be allowed to make one trip without interference was declined by Great Britain on the ground that it might establish a precedent. Despite this warning the *Dacia* sailed from Galveston and was seized by a French cruiser and taken to Brest. The question was sent to the French Prize Court, which decided that the transfer of registry "was tainted with fraud and against the rights of belligerents," and ordered the steamer seized as a prize. The cotton cargo, however, was not involved in the forfeiture, but was purchased by the French government.

THE UNITED STATES AND GERMANY. Submarine Warfare and the War Zone. The present war witnessed for the first time the use of the submarine on a large scale in naval warfare. It was evident that the introduction of this new weapon would give rise to a number of novel questions. The frail construction of these boats made them an easy prey, if seen, for warships or even for unarmed merchantmen which might sink the submarines by ramming them. These conditions made it necessary for the submarines to attack quickly and without warning. Furthermore, the old method of capture, by which a prize crew was placed on the captured vessel, could hardly be followed by the submarine, as the size of the crew was small and could not be spared for this purpose. The only feasible method of disposing of vessels captured by submarines was to sink them. But this raised the question of the safety of passengers and crew. The established rules of international law required that merchant vessels could not be sunk, unless they attempted to escape, until provision was made for the safety of passengers and crew. The United States first became involved in the issue when, on Feb. 4, 1915, Germany declared the waters around the British Isles a "war zone" after Feb. 18, 1915. It declared its intention of sinking every enemy merchant ship found in the zone, even if it was impossible to save the crew and passengers. It also stated that neutral ships entering the "war zone" were in danger.

The United States government promptly took notice of this proclamation, and on Feb. 10, 1915, sent a communication to the German government, calling attention to the serious difficulties that might arise if the policy contemplated were carried out, and declaring that it would hold the German government to a "strict accountability," if any merchant vessel of the United States was destroyed, or citizens of the United States lost their lives. In reply to this note the German government stated on Feb. 18, 1915, that, in view of the illegal methods used by Great Britain in preventing commerce between Germany and neutral countries, even in articles which are not contraband of war, the German

government felt justified in using all means within its power to retaliate on England. Complaint was made of the large quantities of munitions of war which were being sent to Great Britain, and it was stated that Germany intended to suppress such traffic "with all means at its disposal." Finally it was suggested that, in order to avoid mistakes, all American vessels carrying non-contraband through the war zone should travel under convoy.

In order to avoid, if possible, the very serious consequences of the proposed German naval policy, the Government of the United States addressed an identical note to Great Britain and Germany suggesting an agreement between these two powers respecting the conduct of naval warfare. The memorandum contained the following suggestions: (1) That neither power would sow floating mines on the high seas or in territorial waters, and that anchored mines should be placed only in cannon range of harbors for defensive purposes, and that all mines should bear the stamp of the government planting them, and be so constructed as to become harmless when freed from their anchorage. (2) That neither would use submarines to attack the merchant vessels of any nationality, except to enforce the right of visit and search. (3) That each would require their merchant vessels not to use neutral flags for purposes of disguise.

The note further suggested that the United States government designate certain agencies in Germany to which foodstuffs from the United States should be sent, and that the German government guarantee that such foodstuffs be used for noncombatants only. Great Britain was requested to agree not to put foodstuffs on the list of absolute contraband, and that ships of foodstuffs sent to the designated consignees in Germany should not be interfered with.

Nothing of practical importance came from these suggestions. Germany replied, accepting some and rejecting others, while Great Britain reviewed the alleged violations of international law and defended the stoppage of foodstuffs destined for Germany as a legitimate incident of the blockade.

Thus matters rested pending the first case in which an American vessel should be sunk or American lives lost. On March 28, 1915, news was received that the British steamship *Falaba* had been sunk, and that among those lost was an American citizen, Leon C. Thrasher. Accounts differed as to the actions of the steamship when called upon by the commander of the submarine to stop. The German government defended the action on the ground that the *Falaba* had attempted to escape after being warned and that, upon being overhauled, 10 minutes had been allowed for the crew and the passengers to take to the life boats before the vessel was torpedoed. While this case was still under consideration by the United States government, it was reported that the American vessel *Cushing* had been attacked by a German aeroplane in the English Channel on April 29, 1915, one bomb being dropped on the ship which caused some damage but no loss of life.

Within two days following this, word was received that the American steamer *Gulflight* had been attacked by a German submarine off the Scilly Islands on May 1st. Two members of the crew were drowned, and the captain died of heart failure the following morning. Before the Gov-

ernment of the United States had formulated any action in connection with these cases, the civilized world was shocked at the terrible news that the Cunard Line steamship *Lusitania* had been sunk on May 7, 1915, by a German submarine off Old Head of Kinsale at the southeastern point of Ireland, resulting in the loss of 1152 lives, of whom 114 were known to be American citizens (see *LUSITANIA*). Prior to the sailing of the *Lusitania* from New York on her fatal voyage, an advertisement signed by the German embassy appeared in many American newspapers, warning Americans of the danger of traveling on British vessels through the "war zone."

The first feeling of horror at the terrible catastrophe was succeeded by a feeling of bitter resentment in this country at what appeared to be a ruthless sacrifice of innocent lives. It appeared, at first, as if a break between the United States and Germany was inevitable. President Wilson waited six days before taking definite action, stating that it was important to act "with deliberation as well as with firmness." In the meantime the German government on May 10, 1915, sent a communication to the United States government expressing its sympathy for the loss of American lives, but at the same time maintaining that the responsibility rested with the British government, which, "through its plan of starving the civilian population of Germany" by prohibiting the importation of foodstuffs, had forced Germany to resort to retaliatory measures. It was further claimed that British merchant vessels were generally armed, and repeated attempts had been made by such vessels to ram submarines. Finally it was stated that the *Lusitania* carried a large quantity of ammunition in her cargo, and warning had been given by Germany that such vessels were liable to destruction.

On May 13, 1915, the eagerly awaited statement of the United States was sent to Germany. With a dignity and earnestness which the gravity of the situation called for, President Wilson reviewed the series of acts of German submarine commanders, culminating in the sinking of the *Lusitania*, which he said "the Government of the United States has observed with growing concern, distress, and amazement."

Referring to the claim that the alleged illegal acts of her adversaries justified Germany in adopting retaliatory measures, the American note stated that the Government of the United States could not admit that any such measures were legal which infringed the clearly established rights of neutrals under international law. These rights include the protection of the lives of noncombatants traveling on unarmed merchant vessels, and the right of neutrals to travel on the high seas wherever their legitimate business calls them. In view of these clearly established principles, the note stated that "it confidently expects the Imperial German government will disavow the acts of which the Government of the United States complains; that they will make reparation as far as reparation is possible for injuries which are without measure; and that they will take immediate steps to prevent the recurrence of anything so obviously subversive of the principles of warfare, for which the Imperial German government have in the past so wisely and so firmly contended." In conclusion it was stated that "the Imperial German government will not ex-

pect the Government of the United States to omit any word or any act necessary to the performance of its sacred duty of maintaining the rights of the United States and its citizens, and of safeguarding their free exercise and enjoyment."

During the days immediately following the terrible event, newspaper comment in Germany indicated that the feeling in that country was characterized by regret at the loss of so many lives, but that the government was justified in sinking the *Lusitania* on the ground that she was carrying large quantities of ammunition, and that she had guns mounted and concealed between decks. The last charge was categorically denied both by the British authorities and the American port officials at New York.

Some hope was felt that the German government would disavow the act, when on May 11, 1915, a note was issued explaining its attitude with respect to American and other neutral ships in the "war zone." It stated that the German government had no intention of attacking such neutral ships if they were guilty of no hostile act. Even if such ships carried contraband, they were to be dealt with according to the rules of international law applying to prize warfare. It further stated that, if a neutral ship should be destroyed by mistake, the German government would "unreservedly recognize its responsibility therefor." While this did not cover the question involved in the *Lusitania* case, viz. the right of neutrals to travel in safety on merchant vessels under a belligerent flag, nevertheless it was a distinct modification of the policy announced in the proclamation establishing the "war zone."

On May 28, 1915, the German government submitted a note defining its position, in regard to the various questions raised in the American note. With regard to the cases of the *Cushing* and the *Gulflight*, it was stated that an investigation was in progress and the results of this investigation would be communicated to the United States government shortly. (In this connection it is well to state here that a note was sent by the German government on June 4, 1915, expressing regrets for the sinking of the *Gulflight*, explaining that no distinctive marks were seen on the vessel by which she could be identified. Germany further agreed to furnish full recompense for the damage done. In regard to the *Cushing*, the German government asked for additional information in the possession of the American government in order that a conclusion might be reached in the matter.) In regard to the *Falaba*, it was again stated that the commander had disregarded the order to lay to, and had sent up rocket signals for help.

Concerning the *Lusitania*, the German government took the position that the Government of the United States had not considered all of the material facts in the case. It then repeated the charge that the *Lusitania* had guns on board, mounted under decks; that the British government had issued orders to merchantmen to ram submarines; and that in view of these alleged facts the German commanders "were no longer in a position to observe the rules of capture otherwise usual." It was further contended that the *Lusitania* carried large quantities of ammunition and a number of Canadian troops, and that the German government was justified in destroying war munitions destined for the enemy.

Finally it was asserted that the rapid sinking of the *Lusitania* was due to an explosion of the cargo of ammunition. The German government requested the American government to carefully consider the above statements and express its view in regard to them, and that thereupon the German government would make a "final" statement as to its position. This note did not meet the issue squarely and was clearly an invitation to further negotiations between the two governments.

It was at this juncture in the negotiations that Mr. Bryan resigned as Secretary of State on the ground that he was unable to agree with the President as to the proper policy to pursue in dealing with our difficulties with Germany. The two points upon which Mr. Bryan in his letter of explanation stated that he was not in agreement with the President were: (1) as to submitting the *Lusitania* case to the investigation of an international commission, and (2) as to warning Americans against traveling on belligerent vessels or vessels carrying cargoes of ammunition. Mr. Bryan held that the questions in dispute should be considered by an international commission, and that, secondly, American travelers should be warned as above indicated. Much comment was aroused by Mr. Bryan's act, and the consensus of opinion appeared to be that it strengthened rather than weakened the administration.

The next move in the diplomatic game was made on June 9, 1915, when the American government replied to the German government that it noted with satisfaction the position taken by the latter in the cases of the *Cushing* and *Gulflight*. In regard to the *Falaba* the United States was unwilling to admit that the attempt on the part of merchantmen to escape capture alters the obligation of the commander of the attacking vessel to provide for the safety of the lives of those on board the merchantman.

In regard to the statements made by Germany that the *Lusitania* was armed, the American government stated that it had official information that such was not the case. With regard to the carrying of contraband by the *Lusitania*, it was held that this was entirely irrelevant to the question of the legality of the methods used in sinking the vessel. Brushing aside these extraneous issues the American government took its stand firmly on the ground that it was "contending for nothing less high and sacred than the rights of humanity," and it stated that it "very earnestly and very solemnly" renewed its representations made in the previous note.

A reply to this note came from the German government on July 8, 1915. There was in this communication little evidence of a desire to meet the issue. There were the usual assertions in regard to England's "inhuman" methods of warfare and a suggestion for guarding the safety of American vessels in the war zone.

The rejoinder to this note sent by the Government of the United States on July 21, 1915, indicated very clearly that it considered the German communication evasive and unsatisfactory. It stated once more in the clearest manner possible the real question at issue, namely, that acts of reprisal against an enemy are indefensible when they deprive neutrals of their acknowledged rights. The note further gave pointed evidence that the United States government felt that the discussion had gone far enough, and

that "it cannot believe that the Imperial government will longer refrain from disavowing the wanton act of its naval commander." Despite this urgent suggestion from the United States that the matter should be speedily settled, the negotiations dragged on during the remaining months of the year. There was evidence, however, that the German government was attempting to find some solution which would concede most that the United States was contending for, while at the same time avoiding the appearance of being humiliated. For example, on Sept. 1, 1915, Ambassador von Bernstorff in a letter to Secretary Lansing gave assurance that German submarines would not sink any more liners without warning. It is to be noted that this included ships belonging to belligerents as well as neutrals. Finally, in November, the German government authorized its ambassador at Washington to begin negotiations with the American authorities looking to a settlement of all outstanding issues. These negotiations were still in progress at the close of the year.

While the controversy in connection with the *Lusitania* was in process of settlement, a number of other issues had arisen due to attacks on other vessels in which American property and lives were destroyed. These cases will be briefly stated.

On Jan. 28, 1915, the American schooner, *Wm. P. Frye*, loaded with a cargo of wheat consigned to an English firm, was sunk by the German auxiliary cruiser *Prinz Eitel Friedrich*.* In a communication to the German government the Government of the United States contended that the act was unwarranted by international law, as the cargo could only be considered conditional contraband, and there was no evidence that it was to be used for military purposes. To this the German government replied on April 4, 1915, asserting that the act was justified by the Declaration of London, and the German Prize Law. Nevertheless, Germany agreed to pay for the ship and cargo provided it was shown that both belonged to American citizens. This action was based on an interpretation of the treaties of 1799 and 1828 between Prussia and the United States. It was provided, however, that the case should go before the German Prize Court.

The Government of the United States replied to this note on May 5, 1915, declining to submit the question to the German Prize Court, and suggesting direct diplomatic negotiations.

A further German note on June 7, 1915, and an American rejoinder on June 24, 1915, failed to bring the question any nearer to a solution. On July 10, 1915, the German Prize Court rendered its decision justifying the sinking of the *Frye*, but holding that Germany must pay an indemnity under the terms of the Treaty of 1799. The German government then suggested that the amount of indemnity be determined by two experts, one appointed by each government, and that the differences between the governments as to the interpretation of the treaty be submitted

* The *Prinz Eitel Friedrich* and the *Crown Prince Wilhelm*, two German commerce destroyers, entered the harbor of Newport News after extended cruises in the Atlantic and Pacific oceans during which a number of French and English vessels were destroyed. At first the commanders of both vessels indicated their intention of making necessary repairs and putting to sea again. The presence of English war vessels outside the harbor caused them to change their plans, and both vessels were eventually interned.

to arbitration of The Hague Tribunal. These suggestions were accepted by the United States on Aug. 10, 1915, provided that arrangements should be made for the immediate submission to arbitration of the question of the legality of the sinking of the vessel. The United States further requested a statement from Germany as to whether it intended to govern future naval operations, pending the arbitration, according to its interpretation of the treaty. To this the German government replied on Sept. 23, 1915, that no more American merchantmen would be destroyed when carrying conditional contraband, but that it reserved the right to sink such vessels carrying absolute contraband.

In a further note the United States government on Oct. 18, 1915, stated that, pending arbitration, it could agree to the sinking of American vessels carrying absolute contraband only on condition that persons on board such vessels were placed in "safety," and that this condition would not be satisfied by placing them in lifeboats in the open sea. To this suggestion the German government replied on Nov. 29, 1915, stating that it agreed that all possible provisions should be made for the safety of persons on a vessel to be sunk. It was stated that thereafter no persons would be ordered into lifeboats unless conditions of weather and the proximity of land made it "absolutely certain that the boats will reach the nearest port."

This closed the controversy over the *Frye* case, and the outcome was a notable victory for the American contention for the safety of innocent persons on the high seas.

On May 25, 1915, the American steamer *Nebraskan* was torpedoed, 40 miles southwest of Fastnet, off the coast of Ireland. The ship was not seriously damaged and no lives were lost. After an investigation, the German government explained that the attack was an "unfortunate accident," due to the fact that the vessel displayed no flag or distinguishing marks to indicate its nationality. Regret was expressed and liability for damage sustained was assumed by Germany.

The destruction of the Allan liner *Hesperian* on Sept. 4, 1915, by which an American citizen named Wolff was drowned, involved a question of fact. Germany maintained that the ship was sunk by a mine, not by a submarine. Great Britain, on the other hand, asserted that fragments of a torpedo had been picked up on the deck of the *Hesperian* after she was struck. Samples of this metal were submitted to American naval experts who declared that they were parts of a torpedo. The United States authorities held, however, that there was no conclusive evidence that the fragments of metal were found on the *Hesperian*, and the case was dropped.

The Arabic Case. The White Star liner *Arabic*, outward bound for New York, was torpedoed and sunk by a German submarine off Fastnet on the morning of Aug. 19, 1915. Eighteen passengers and 21 members of the crew were reported missing. Among those lost were two American citizens. Depositions of survivors indicated that the *Arabic* was torpedoed without warning and had made no attempt to escape or to ram the submarine. A formal and detailed communication from Ambassador Gerard on Sept. 7, 1915, stated that the German government had received information that the *Arabic* had altered its course while approaching the



Photograph by Paul Thompson

DR. BERNHARD DERNBURG
Representative of Germany



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CAPTAIN KARL BOY-ED
German Naval Attache

REPRESENTATIVES OF THE TEUTONIC POWERS IN THE UNITED STATES, 1915

submarine, and the commander of the latter was led to believe that the *Arabic* was attempting to ram his vessel. Furthermore, the German government maintained that it was unable to acknowledge any obligation to grant any indemnity in the matter, even if the commander should have been mistaken as to the aggressive intentions of the *Arabic*. The note further suggested that if the German and American governments could not reach an agreement in the issue, that the question be referred to The Hague Tribunal for arbitration.

This note was wholly unsatisfactory to the American government and a grave crisis arose. The President and Secretary Lansing stood firm on their demand that Germany should disavow the act of the submarine commander, and should pay an indemnity for the loss of American lives. The crisis was passed when, on Oct. 5, 1915, Count Bernstorff notified the American government that Germany had acceded to the demands of the United States, and that the instructions issued to the commanders of submarines had been made so stringent that a repetition of incidents similar to the *Arabic* case was considered out of the question.

Shipment of War Munitions. Shortly after the outbreak of the war large orders for war munitions were placed by the Entente Allies with American firms. The complete control of the seas by the British and French fleets made it impossible for the Teutonic powers to obtain similar supplies. Comment in the German press indicated that the feeling in Germany was very strong that the United States was not observing a strict neutrality by allowing such shipments. On April 4, 1915, Ambassador Bernstorff called the matter to the attention of the United States government officially. He maintained that while the United States had taken no action in regard to alleged violations of international law by Great Britain in interfering with neutral trade, it had allowed American firms to supply large quantities of war munitions to Germany's enemies. He maintained that conditions in the present war were unique, that while theoretically arms might be shipped from the United States to Germany, practically they could be sent only to her enemies. A real spirit of neutrality called for the stoppage of a trade which was aiding only one side.

In a vigorous reply to this note President Wilson set forth clearly the position of the United States. He first called attention to the fact that our relations with England could not be made a subject of discussion with a third government. With regard to the shipment of arms and ammunition, the President pointed out that any change in the laws of neutrality during the progress of a war would be a departure from the principle of strict neutrality, and that the placing of an embargo on the trade in arms would constitute such a change.

In reply to a similar protest by the Austro-Hungarian government on Aug. 1, 1915, the Government of the United States on Aug. 12, 1915, made an exhaustive statement of its position. It reiterated the statement made in the reply to Germany that any change in the rules of neutrality made during a war would violate the spirit of neutrality. In addition, it pointed out that it had never been the policy of the United States to maintain a large military establishment or great stores of ammunition, and

that the United States had depended upon the right to purchase arms and ammunition from neutral powers in time of war. To prohibit such trade would compel every nation to have on hand sufficient munitions of war to meet any emergency, and would practically make every nation an armed camp. Apart then from any question of the legality of an embargo on arms, the United States government felt that it would be a mistaken policy as it would deliberately encourage the spirit of militarism.

Activities of German Agents in the United States. During the year the United States authorities were called upon to deal with a number of serious questions involving the activities of agents and officials of the German government, and German sympathizers in the United States. These activities included the obtaining of false manifests and clearance papers for vessels sent from American ports with supplies for German cruisers; the obtaining of fraudulent passports; subsidizing American newspapers; and efforts to hamper the shipment of arms and ammunition to Great Britain. While conclusive evidence was lacking that the German government or its official representatives in this country were responsible for such of these acts as violated the laws of the United States, nevertheless the Government of the United States considered the actions of two German officials, Capt. Karl Boy-Ed and Capt. Franz von Papen, the German naval and military attachés, to have been sufficiently culpable to demand their recall. This request was agreed to by the German government. Other prominent Germans aroused by their actions considerable criticism. Conspicuous among them was Dr. Bernard Dernburg, who during the early part of the war, had been the head of the pro-German propaganda in the United States. His outspoken defense of Germany in the *Lusitania* case, and his general aggressive attitude caused such strong protests that he voluntarily returned to Germany. Dr. Heinrich F. Albert, financial agent of the German government in the United States, was, according to a series of articles published in the *New York World*, involved in an elaborate scheme to subsidize American newspapers, to establish munition factories to supply arms and ammunition to Germany, and in general to foster a pro-German sentiment in the United States. Dr. von Nuber, the consul general of Austria-Hungary, was accused by Dr. Joseph Goricar, formerly Austro-Hungarian consul at San Francisco, of plotting to destroy munition factories in the United States. Carl Buenz, director of the Hamburg-American Steamship Company, was indicted on the charge of conspiracy to defraud the United States by procuring false manifest and clearance papers. Among the less prominent persons whose activities attracted wide attention, was Lieutenant Robert Fay, an ex-officer of the German army, who was arrested for having large quantities of high explosives in his possession. The confession of an accomplice clearly indicated that the explosives were to be used to destroy ships belonging to the enemies of Germany. Werner Horn, a German subject, was arrested for attempting to wreck the international bridge between Vanceboro, Maine, and St. Croix, New Brunswick.

THE UNITED STATES AND AUSTRIA-HUNGARY. During the year 1915 two serious disputes arose

involving the United States and Austria. The first of these concerned the activities of the Austro-Hungarian ambassador to the United States, Dr. Theodor Dumba.

On Sept. 1, 1915, James F. J. Archibald, an American newspaper correspondent, was arrested by the British authorities when the steamer *Rotterdam* put into Falmouth, for carrying dispatches from the German and Austrian embassies at Washington to Berlin and Vienna. Among the papers was a letter from Dr. Dumba, suggesting a plan for crippling the munitions factories in America by fomenting strikes among the Austro-Hungarian laborers in these factories. Dr. Dumba admitted the authenticity of the documents, and defended his action on the ground that it was his duty to bring to the attention of his fellow countrymen employed by the manufacturers of munitions that they were engaged in enterprises unfriendly to the fatherland, and that the Imperial government would regard them as guilty of a serious crime, punishable by penal servitude should they return to their own country.

This explanation proved unsatisfactory to the American government, and Secretary Lansing notified the Austrian government that, as Dr. Dumba had "conspired to cripple legitimate industries of the people of the United States, and had flagrantly violated diplomatic propriety by employing an American citizen protected by an American passport as a secret bearer of official dispatches through the lines of the enemy of Austria-Hungary," he was no longer acceptable to the United States as the ambassador from Austria-Hungary. In answer to this demand the Austro-Hungarian government agreed, on Sept. 27, 1915, to recall Dr. Dumba.

The second incident involving the two countries was the sinking of the Italian steamer *Ancona* on Nov. 7, 1915, by an Austrian submarine. The *Ancona* had attempted to escape, but was overhauled. It was charged by the survivors that the submarine continued to fire after the *Ancona* had stopped. In all, more than 200 lives were lost, among them nine American citizens. In a vigorous note the Government of the United States, on Dec. 6, 1915, demanded that the Austro-Hungarian government should disavow the act, that the commander of the submarine should be punished, and that an indemnity should be paid for the loss of the lives of American citizens.

To this the Austro-Hungarian government replied on Dec. 15, 1915, asking for more specific information upon which the Government of the United States based its charges. On Dec. 19, 1915, the American government replied, stating that it based its charges on the official report of the Austro-Hungarian admiralty, and declined further to specify the additional testimony tending to corroborate the admiralty's report. The incident was closed by the Austro-Hungarian government granting practically all of the American demands. In a note sent Dec. 29, 1915, it was stated that the submarine commander had been punished for not taking into consideration the panic aboard the *Ancona*, which rendered disembarkment difficult. It agreed that Austria-Hungary should indemnify American citizens affected. While disclaiming responsibility for lives lost, due to shots which were fired while the *Ancona* was attempting to escape, or for those lost by the faulty lowering of life-

boats, Austria agreed not to press for proof that the American lives were lost through the fault of the submarine commander, and agreed "to extend indemnities to those whose cause cannot be established." In conclusion the note stated that the Austro-Hungarian government "reserved to itself the right to bring up for discussion at a later time the difficult questions of international law connected with submarine warfare."

SUMMARY. Briefly summarized, the outstanding results of these various controversies between the United States and the different European powers appear as follows:

With Great Britain little was accomplished during the year in reaching a satisfactory understanding in regard to the interference with neutral trade. The Government of the United States had placed itself on record as considering the blockade of Germany as "ineffective, illegal, and indefensible." This at least served notice that the United States was unwilling to acquiesce in what appeared to be an unwarranted extension of the principle of the blockade, and also, perhaps, laid the foundation for future claims for damages due to injuries done to American trade.

Greater progress was made during the year in solving the difficulties which had arisen between Germany and the United States. Starting with the assertion that all belligerent merchantmen in the war zone would be sunk and that neutral vessels entering this area did so at their own risk, Germany gradually retreated, first agreeing not to attack neutral vessels and to offer reparation for such as might be sunk by "accident," and second that if any vessel should be sunk, full provision should be made for the "absolute safety" of persons on board. The one important controversy between the two countries which remained unsettled at the close of the year was that growing out of the sinking of the *Lusitania*, and this hinged largely on the question whether Germany was willing to recognize the illegality of that act.

Public opinion in the United States was sharply divided as to the lessons to be drawn from the war, and as to the policy which this country should adopt. On the one hand a vigorous campaign was inaugurated to strengthen the military and naval defenses of the United States. (See **MILITARY PROGRESS**; **NAVAL PROGRESS**; and **PREPAREDNESS**.) It was urged with great earnestness that the war had demonstrated the futility of military unpreparedness, and that the United States was in particular danger because of her great wealth, which other nations would covet.

On the other hand it was urged with equal fervor that the cause of the war was primarily the great military armaments in Europe, and that the United States would make a great mistake by joining in the competition for military preparedness. It was pointed out by the advocates of peace that the energies of this country should be devoted to finding some means, if possible, to end the war, and to further the plans for preventing future struggles. If not the most effective, certainly the most picturesque, of the efforts of the pacifists in the United States during the year was the expedition organized by Henry Ford, a millionaire automobile manufacturer. He gathered together about 150 men and women, some of them more or less prominent

Americans, and including newspaper and magazine writers and moving picture men, and took them with him to Europe with the purpose of discovering some means of ending the war. Of the sincerity of Mr. Ford there was no question, but the methods used in organizing the movement, and the actions of some of the persons prominently identified with it, seriously impaired the chances of its success. The United States authorities let it be known that it was in no sense officially sanctioned, while the European countries at war clearly indicated that the expedition was not welcome. Despite these discouragements the party sailed on the Scandinavian-American liner *Oscar II* on Dec. 4, 1915. During the voyage serious discord developed among the members of the party. The expedition reached Christiansand, Norway, on Dec. 18, 1915. A few days later it was announced that Mr. Ford would have to leave the party and return to America because of illness. The remainder of the party went on to Copenhagen, reaching there on the last day of the year. The prospects that the expedition would accomplish anything of importance toward ending the war were not bright.

UNITED STATES COMMISSION ON INDUSTRIAL RELATIONS. See INDUSTRIAL RELATIONS COMMISSION.

UNITED STATES DEPARTMENT OF AGRICULTURE. On July 1, 1915, the partial reorganization of the Department proposed by Secretary Houston and approved by Congress went into effect. The main divisions of the Department are now as follows: Office of the secretary, including the offices of the assistant secretary, solicitor, chief clerk, appointment clerk, farm management, exhibits, and information; weather bureau; bureau of animal industry; bureau of plant industry; forest service; States relations service; bureau of chemistry; bureau of soils; bureau of entomology; bureau of biological survey; bureau of crop estimates; office of public roads and rural engineering (including irrigation, drainage, farm architecture, etc.); office of markets and rural organization; division of accounts and disbursements; division of publications; and the library.

The work of the office of markets and rural organization has been greatly enlarged and now includes studies of market conditions, methods of grading, standardizing, packing, and shipping, the means by which farm produce gets to the consumer, rural credits, insurance and communication, and rural social and educational activities.

The States relations service represents the secretary of agriculture in his relations with the State agricultural colleges and experiment stations, including the administration of the Hatch and Adams Acts relating to the stations, the cooperative agricultural extension work provided for by the Smith-Lever Act (see AGRICULTURAL EXTENSION WORK), the farmers' cooperative demonstration work, investigations relating to agricultural schools, farmers' institutes, and home economics, and the maintenance of agricultural experiment stations in Alaska, Hawaii, Porto Rico, and Guam.

The library now contains 133,000 books and pamphlets, mainly on agriculture and agricultural science, and currently receives 2128 periodicals.

In his annual report for 1915 the secretary

of agriculture recommended legislation along the following lines—(1) To promote better handling and storing of farm products, and trading on the basis of fixed grades and standards, including a permissive warehouse act, a cotton-standard act, a grain-grades act, and provision for a market-news service; (2) a land-mortgage banking act; (3) assistance in roadmaking and similar improvements to communities near the national forests; (4) authority to grant water-power permits within the national forests for fixed periods; (5) classification of the remaining public grazing lands; (6) more effective control over the production of hog-cholera serum; (7) continuance of appropriations for the purchase of forest lands in the Appalachian and White mountains.

The appropriations for the Department for the year ended June 30, 1915, amounted to \$19,865,832 for ordinary expenses, in addition to permanent and special appropriations amounting to \$10,628,008, making a total of \$30,493,840.

The forest service received \$2,481,469 from the sale of timber on the national forests, grazing and water-power permits, condemned property, etc. Fines and recoveries in cases arising under the food and drugs and insecticide acts amounted to \$130,000; and court decisions resulted in the retention in the national forests of about 18,000 acres of land supporting 155,000,000 feet of timber worth about \$700,000.

The Department continued cooperation with the postmaster-general in the improvement of selected mail-route roads for which Congress appropriated \$500,000, conditioned on the raising of double that amount by the States in which such roads are located.

The appropriations for the year ending June 30, 1916, for ordinary expenses amounted to \$22,971,782, but most of the increase was actually caused by the inclusion of items for which the Department had special appropriations the previous year. In the main, existing projects were continued with the same allotment of funds and comparatively few new lines of work were provided for.

In 1915 the Department issued 913 new publications and a large number of reprints, aggregating more than 36,000,000 copies.

There were 16,223 employees on July 1, 1915, of whom 3594 were employed in Washington. The number of women employed was 1921.

UNITED STATES DEPARTMENT OF AGRICULTURE. See AGRICULTURAL EDUCATION, *Educational Work of Department of Agriculture.*

UNITED STATES MILITARY ACADEMY. The total enrollment in the academy in the autumn of 1915 was 627. The faculty numbered 125. There were no notable changes in the membership of the faculty during the year, and no noteworthy benefactions were received. The library contained about 95,000 volumes. The superintendent in 1915 was Col. Clarence P. Townsley.

UNITED STATES NATIONAL MUSEUM. The museum is a part of the Smithsonian Institution (q.v.), and the assistant secretary in charge for 1915 was Richard Rathbun. For the year ending June 30, 1915, the collections received additions of 1481 accessions, aggregating about 304,647 specimens. These were classified as follows: Anthropology, 16,140; botany, 51,-

295; geology and mineralogy, 4063; mineral technology, 607; paleontology, 129,981; zoölogy, 101,928; textiles and animal and vegetable products, 1511; National Gallery of Art, 122. The most important gifts in ethnology comprised a Dutch Borneo collection made by H. C. Raven and donated by W. L. Abbott; modern Egyptian clothing contributed by H. E. Winlock; articles from the Plains Indians, collected by Maj. G. H. Palmer; and a large series of old Japanese art, collected by J. C. Lyon. In Old World archaeology an accession of 90 Neolithic stone implements was received in an exchange from the Royal Museum of Natural History at Brussels, Belgium, and H. E. Clark presented 19 stone implements for addition to the Palestine collection. With the gift of a collection of pianos, 24 examples of European make and 46 American, from Hugo Worch of Washington, D. C., the museum's section of musical instruments is now one of the finest in the world. As in former years the museum received large collections of mammals and higher animals, this year from Dutch East Borneo and Kashmir, for which it is indebted to W. L. Abbott. John B. Henderson, in his expedition, obtained for the museum about 10,000 mollusks and other invertebrates, and some 3000 fishes. In January, 1915, the gift of Charles L. Freer of Detroit, Mich., to the National Gallery of Art was increased by 110 articles, of which 8 are American and 102 Oriental. William T. Evans, of New York, contributed four paintings and one bronze. During the year 14,843 specimens in natural history, in 163 sets, were distributed among American schools and colleges. The number of visitors admitted to the new building during the year were 262,135 for week days and 59,577 for Sundays, and those admitted to the older building totaled 133,202. Publications for the year comprised 9 volumes and 41 separate papers, and of these 54,000 copies were distributed. The museum participated in the Panama-Pacific Exposition at San Francisco, and in the Panama-California Exposition at San Diego.

UNITED STATES NAVAL ACADEMY.

The total enrollment in all the departments in the autumn of 1915, including the graduate department, was 933. The faculty included 131 members. During the summer investigations relating to conditions bearing on examinations were held. These began on June 7th and ended on July 15th. As a result of them two midshipmen were dismissed and about a dozen others disciplined. It was charged and proved that these midshipmen had used illegitimate means to secure advance information in regard to examinations. In addition to those dismissed or disciplined, it was found that other members of all the classes had received information in regard to examinations prior to the holding of these examinations. Rear Admiral Fullam was removed as superintendent on September 1st. Capt. E. W. Eberle was appointed superintendent to succeed him. On October 1st, President Wilson issued an order directing the dismissal of six midshipmen, the suspension of four others for one year without pay, and the turning back of 15 midshipmen into the next lower class for hazing.

UNITED STATES STEEL CORPORATION. See TRUSTS.

UNIVERSALISTS. This denomination in 1915 had in the United States and its posses-

sions 55,000 communicants, 656 ministers, and 763 churches, the Sunday schools containing about 50,000 pupils. Foreign missionary work is carried on in Japan and China. Social work is carried on by the commission on social service, organized in 1910, which has undertaken the educational work of stimulating interest in the subject among ministers, divinity students, men's clubs, women's societies, and young people's societies. Social service topics are discussed at church gatherings, and there is an exchange of social service information through the church press. The institutions of higher education are: Tufts College, at Medford, Mass.; St. Lawrence University, Canton, N. Y.; Buchtel College, Akron, Ohio; and Lombard College, Galesburg, Ill.

UNIVERSITIES AND COLLEGES. AT-

TENDANCE. The only available statistics of attendance at the various universities, colleges, and technological schools for the first semester of 1915-16 are found in an article by Henry T. Claus in the Boston *Transcript*. The enrollment in 60 institutions is given for Nov. 1, 1914, and Nov. 1, 1915. The total number of students in these 60 institutions on Nov. 1, 1915, is 119,434. This is an increase of nearly 7 per cent over the previous year.

The latest report of the Commissioner of Education covering the academic year 1913-14 shows that in the 567 universities, colleges, and technological schools from which reports were received, there were 216,493 students in the collegiate and resident graduate departments. This is an increase of 7 per cent over the previous year. There were, in addition to these, 37,444 students in music, art, oratory, business, etc., not registered for a degree, and 51,864 students who were in the preparatory departments. Excluding duplicates these institutions enrolled in all departments 217,683 men and 117,295 women.

Professional schools, including theology, law, medicine, dentistry, pharmacy, and veterinary medicine, reported 66,873 students, and 12,582 instructors in 1914. There were 15,686 graduates. The schools of medicine and pharmacy were the only ones not showing an increase in the number of students. The following table shows the enrollment in the various classes of professional schools for certain years:

Class	Year			
	1905	1910	1913	1914
Theology	7,411	11,012	10,965	11,269
Law	14,714	19,567	20,878	20,958
Medicine	25,885	21,394	17,238	16,920
Dentistry	7,149	6,439	8,015	9,315
Pharmacy	4,944	6,226	6,165	5,930
Veterinary medicine..	1,269	2,717	2,824	2,481
	61,822	67,355	65,585	66,873

A preliminary report on the study of legal education undertaken by the Carnegie Foundation for the Advancement of Teaching presents the following facts regarding physicians and surgeons, clergymen, and lawyers: "While the number of physicians and surgeons in the country, now 157,000, and of clergymen, now 133,000, has recently increased uniformly with the population, the number of lawyers, now 122,000, increased only one-third as fast as the population between 1900 and 1910, although it increased faster than the population between 1890 and

1900, from 89,000 to 114,000, and very much faster between 1880 and 1890, from 64,000 to 89,000."

ACADEMIC FREEDOM. Two cases of difficulty between instructors in universities and the administrative authorities have received a great deal of attention during the year. At the University of Utah the president did not nominate four professors and instructors for the academic year 1915-16. The faculty, alumni, students, and many citizens objected to this action, but on March 17th the regents sustained the president and reelected him for a term of two years. As a result 17 members of the faculty resigned their positions on the ground that it seemed to them "impossible to retain their self-respect and remain in the university." To justify their position the regents issued a statement in which they said: "The university enters into contracts with its professors and instructors for one year at a time. When these contracts expire the professors and instructors are at liberty to decline further employment with the university. The board has the same right to decline again to employ them. Professors and instructors look after their best interests from their own viewpoint. The university does the same. Not infrequently professors decline further employment and leave the university because they can obtain better positions or more remuneration elsewhere. The board considers that both parties have equal rights as to freedom of contract." They charged that one instructor had "seen fit to belittle the university and to speak in an uncomplimentary way of the administration," that another instructor had "seen fit to speak very disrespectfully, if not insultingly, of the chairman of the board of regents." The council of the American Association of University Professors authorized the appointment of a committee of inquiry to report upon the case.

A number of departments were involved in the difficulty. It seemed best to the council of the American Association of University Professors "to take measures to secure a thorough investigation of the conditions of professorial service in the university." A committee was therefore appointed to investigate and report on the case. The results of their work are contained in a pamphlet of 82 pages entitled *The Report of the Committee of Inquiry on Conditions at the University of Utah*. The charges made by President Kingsbury against certain of the professors are summarized as follows: (a) "speaking in a very uncomplimentary way about the administration;" (b) "speaking very disrespectfully of the Chairman of the Board of Regents;" (c) "speaking in a depreciatory way of the university before classes;" (d) "working against the administration." With regard to the charges specified above the committee finds as follows: (1) Of the four charges brought against these professors, two specify acts—namely (a) uttering in a private conversation with a colleague an unfavorable opinion of the chairman of the board of regents, and (b) speaking, in private conversation, in "a very uncomplimentary way of the university administration"—which are not proper grounds for the dismissal of university teachers. (2) The president of the university and the chairman of the board of regents, by sanctioning the recent action and publication of the board, virtually gave notice that the expression by a pro-

fessor, in private conversation, of an unfavorable judgment of their qualifications for office would be a ground for dismissal. This attitude, unjustifiable in general, the committee regards as especially unsuitable in officials of a State university.

The trustees of the University of Pennsylvania terminated the connection of Dr. Scott Nearing with the institution. Their action called forth a great deal of discussion and criticism on the part of alumni of that university and others interested in university administration. It was claimed that, for the past two years, it had been repeatedly stated by the press that Dr. Nearing would be dismissed because his views differed from those of the trustees. The trustees unanimously adopted a resolution in which the following statement of conditions occurs: "In order to discharge the duty laid upon the board by the charter, the trustees are required to observe and determine the qualifications of prospective teachers before appointing them as professors. The usual routine is an engagement as an instructor, an advance to an assistant professorship, followed—if justified—by appointment as professor. Dr. Nearing followed this usual course. He was found to have an attractive personality and many good qualities as a teacher. During the entire period of the few years in which he was connected with the university, however, his efforts—although doubtless perfectly sincere—were so constantly and continuously misunderstood by the public and by many parents of students, that, much to the regret of the trustees, they felt unable to give him the promotion to a professorship which he would otherwise have obtained. The termination of his temporary engagement was, therefore, absolutely in the line of the duty laid upon the trustees by the charter and in justice to Dr. Nearing himself, who was thus free to employ his talents in fields not circumscribed by either requests or promises to avoid strife and turmoil, which are neither necessary nor desirable accompaniments of the objects for which young men are sent to college by their parents."

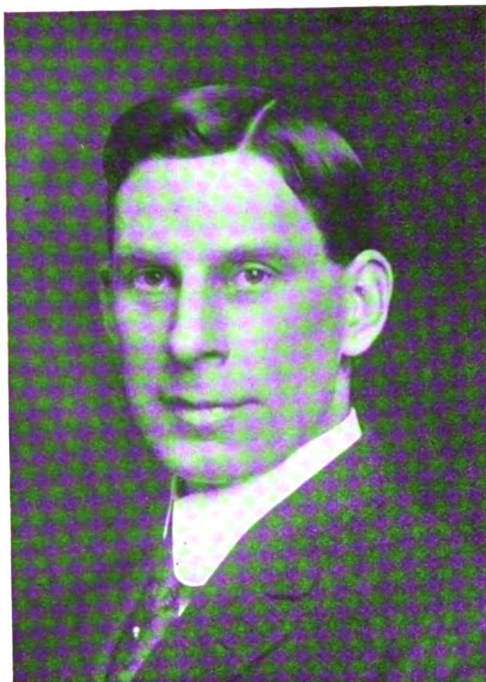
As one of the results of the dropping of Dr. Nearing, members of the faculty of the university urged "the definition of the conditions under which professors may be appointed or dismissed." At a recent meeting of the trustees an important amendment to the statutes was adopted. It provides: "There shall be four grades in the faculty—professor, assistant professor, instructor, and assistant. Professors are to be appointed for an indefinite term. An assistant professor will receive a first appointment for three years, and reappointments for terms of five years. Instructors and assistants will be appointed for one year." The section dealing with the removal of a professor or assistant professor is as follows: "A professor or an assistant professor shall be removed by the board of trustees only after a conference between a committee, consisting of one representative from each of the faculties in the university (such representatives being chosen by the faculty of which the representative is a member), and a committee of equal number from the board of trustees, at which conference the provost shall preside, and upon a report from such conference to the board of trustees for consideration and action by them."

A committee of inquiry of the American Association of University Professors, of which A. O. Lovejoy of Johns Hopkins University is chairman, is preparing a report on the case.

THE AMERICAN ASSOCIATION OF UNIVERSITY PROFESSORS. A meeting called for the purpose of organizing the American Association of University Professors was held in New York City Jan. 1 and 2, 1915. Over 250 were in attendance. Prof. John Dewey of Columbia University was elected permanent chairman, and Professor Overstreet of the College of the City of New York was made recording secretary. The meeting decided upon the principles involved in the several articles of the constitution. A committee was appointed to draw up the text of a provisional constitution in conformity with the action taken by the meeting. This draft was to be submitted for ratification at the next annual meeting, held in Washington, D. C., December, 1915. The decisions with respect to some of the principal features of the plan of organization were as follows: Any person may be nominated for membership who holds, and for 10 years has held, a teaching or research position in any one, or more than one, American university or college, or in a professional school of similar grade; provided, that no person not having teaching or research for his principal occupation, and no administrative officer not giving a substantial amount of instruction, shall be eligible. For the guidance of the council in acting upon nominations, it was voted, upon motion of Professor Janeway, that "it is the sense of this meeting that the association shall be composed of college and university teachers of recognized scholarship or scientific productivity." In an introductory address Prof. John Dewey discussed the purposes of the proposed association. He said: "We are in a period of intense and rapid growth of higher education. No minister of public education controls the growth; there is no common educational legislature to discuss and decide its proper course; no single tribunal to which moot questions may be brought. There are not even long-established traditions to guide the expansive growth. Whatever unity is found is due to the pressure of like needs, the influence of institutional imitation and rivalry, and to informal exchange of experience and ideas. These methods have accomplished great things. Within almost a single generation our higher education has undergone a transformation amounting to a revolution. And I venture to say that, in spite of the deficiencies we so freely deplore, no country has at any time accomplished more in the same number of years. . . . The need of a voluntary organization is the greater because of certain facts in the history of the American university. The rapid growth already referred to has occurred under a machinery designed for very different conditions. We are doing our educational work under methods of control developed decades ago, before anything like the existing type of university was thought of. Our official methods of fixing fundamental educational policy as well as of recruiting, appointing, promoting, and dismissing teachers, are an inheritance from bygone conditions. Their lack of adaptation to the present situation is due not to sinister intent, but to the fact that they are a heritage from colonial days and provincial habits. The wonder is not that there is so much rest-

lessness and friction, but that there is not more. A system inherently absurd in the present situation has been made workable because of the reasonableness and good will of the governors on one side and, even more, of the governed on the other. . . . Let me add that I can think of nothing so well calculated to lift discussions of educational defects and possibilities from the plane of emotion to that of intelligence as the existence of a truly representative body of professors. The best way to put educational principles where they belong—in the atmosphere of scientific discussion—is to disentangle them from the local circumstances with which they so easily get bound up in a given institution. So to free them is already to have taken a step in their generalization. The very moment we free our perplexities from their local setting they perforce fall into a truer perspective. Passion, prejudice, partisanship, cowardice, and truculence alike tend to be eliminated, and impartial and objective considerations to come to the front. The very existence of a recognized free forum of discussion with one's fellows gathered from all parts of the country will make for sanity and steadiness quite as much as for courage." Newspaper reports had frequently asserted that the purpose of the association was to safeguard the cause of academic freedom. Professor Dewey maintained that cases of infringement upon the rights of instructors were "too rare to demand or even suggest the formation of an association. Existing learned societies are already disposed to deal with cases of infringement as they may come to light. The existence of publicly recognized and enforced standards would tend almost automatically to protect the freedom of the individual and to secure institutions against this abuse."

BENEFACTIONS. The aggregate of gifts and bequests, including grants, of the different cities and municipalities reported for the year 1913-14, is \$26,670,017, an increase of \$2,018,059 over the previous year. Of this amount \$4,598,372 was designated for increase of plant, \$3,648,789 for current expenses, and the remainder, \$18,422,856, for endowment. Forty-five institutions reported gifts above \$100,000. During 1915 the following institutions have announced gifts and bequests: Barnard College, \$500,000, by Mr. Jacob H. Schiff, for a students' building; University of Buffalo, property worth \$140,000, by Women's Educational and Industrial Union; University of Cincinnati, \$250,000, by Mrs. Mary M. Emory for a Medical College Building, contingent upon raising of additional \$250,000, which was accomplished by July 1st; Cornell University, \$100,000, by George F. Baker, for dormitory; Delaware College, \$500,000 by one who refused to divulge his name; Harvard University, \$150,000, by will of Mrs. Eunice Melles Hudson, to found a professorship in Archaeology; \$250,000, by Mr. James J. Hill and others, for establishment of instruction in scientific railroading; \$100,000 by will of James J. Myers; Harvard College Observatory, \$150,000, by will of Mrs. Mary Anna Palmer; University of Illinois, \$215,000, by Capt. Thomas J. Smith; Illinois Wesleyan University, \$200,000, from Mrs. Martha Buck; Massachusetts Institute of Technology, two anonymous gifts of \$150,000 and \$100,000, for dormitories; Miami University, \$270,000, by will of Mrs. Laura L. Ogden Whaling; Middlebury College, \$200,000, by Bar-



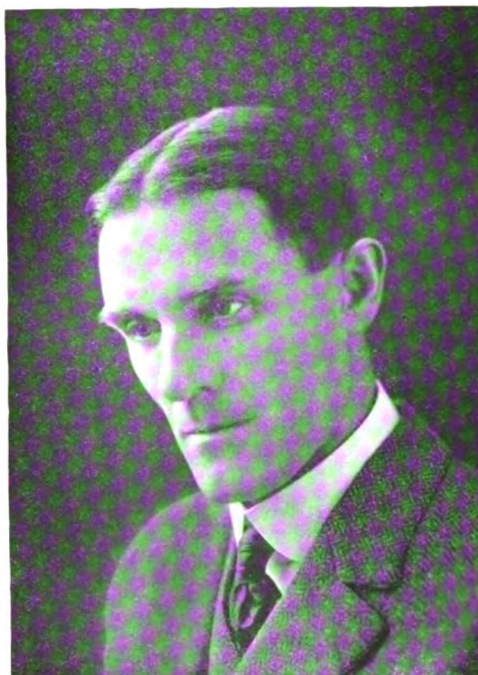
RAY LYMAN WILBUR, A.M., M.D.
President Leland Stanford Jr. University



HENRY SUZALLO, Ph.D.
President University of Washington



The Reverend JOSEPH A. MULRY, S.J.
President of Fordham University



EDWARD C. ELLIOTT, Ph.D.
Chancellor University of Montana

FOUR EDUCATORS PROMINENT IN 1915

ton A. Hepburn, for men's dormitory; Northwestern, estate valued at \$1,005,000, by will of John R. Lindgren; Oberlin College, \$3,000,000, by will of Charles M. Hall; \$165,000, by Mrs. D. F. Allen, for erection of an art building; Pomona College, complete endowment fund of \$1,000,000; Princeton University, \$125,000, from Mrs. William Church Osborn to establish Dodge professorship of mediæval history; \$100,000 from anonymous giver to endowment of professorship in economics; Sheffield Scientific School, Yale University, \$100,000, by Frederick W. Vanderbilt; \$100,000, by graduate of class of 1887; Simmons College, \$100,000, by will of Miss Helen Collamore; Stevens Institute, \$100,000, by William Hall Walker, for laboratory of mechanical arts; Teachers College, Columbia University, \$500,000, by will of Miss Grace Hoadley Dodge; University of Virginia, \$100,000, from John B. Cobb, for a new laboratory; Wellesley College, completed endowment fund of \$2,000,000; Yale University, about \$1,000,000, by will of Justus S. Hotchkiss; an amount estimated from \$750,000 to \$1,500,000, by will of Gen. Brayton Ives; \$350,000 for Anna M. R. Lauder Memorial Foundation, School of Medicine; Yale College, \$150,000, from Charles H. Pine for scholarship fund.

THE CARNEGIE FOUNDATION FOR THE ADVANCEMENT OF TEACHING. The ninth annual report of the president and the treasurer of the Carnegie Foundation for the Advancement of Teaching, for the year ending Sept. 30, 1914, shows a total endowment of \$14,250,000, a surplus of \$1,245,000, an annual income of \$746,000, and an annual expenditure of \$716,000. Of this \$32,000 was spent in administration, \$47,000 in educational inquiry and \$634,000 in retiring allowances and pensions. During the year 29 retiring allowances and 15 widows' pensions were granted, the average grant being \$1648. The total number of allowances now in force is 332, the total number of widows' pensions 100, the general average grant being \$1594. The total number of allowances granted since the beginning of the foundation is 595, the total expenditure for this purpose being \$3,551,000. The Division of Educational Inquiry reported three extensive studies in hand: First, the study of legal education, undertaken at the request of a committee of the American Bar Association. The requirements and examinations for admission to the bar in each of our States were studied at first hand and each of the separate institutions that are teaching law throughout the country has been or will be visited. Second, a comprehensive study of engineering education, undertaken at the request of a joint committee representing the six national engineering societies. Special studies were made of the situation of the student upon entering and upon leaving his engineering studies. Several thousand engineers are coöperating in formulating the views of the profession concerning the present methods and results of the engineering schools. Third, a study of the training of teachers in the State of Missouri, undertaken at the request of the Governor, the State Superintendent, and representative educators of the State. All of the institutions providing such training are being studied in the light of reports upon the training and status of each of 18,000 teachers of the State.

DEGREES. The 567 institutions reporting to

the Bureau of Education conferred 26,533 baccalaureate, 5248 graduate and 749 honorary degrees in 1914. The B.A. degree was conferred upon 7368 men and 7331 women, the B.S. upon 5026 men and 1069 women, the M.A. upon 1680 men and 853 women, and the Ph.D. upon 446 men and 73 women. According to *Science*, Oct. 22, 1915, 556 degrees of Doctor of Philosophy or Science were conferred in 1915. Of these 300 were in the natural and exact sciences. Eighty-five were given in Chemistry. This is more than twice the number found in any other subject. The University of Chicago conferred 79, Columbia 70, and Harvard 58.

GENERAL EDUCATION BOARD. During the year the General Education Board announced the following gifts: Vassar College, \$200,000; Denison University, \$125,000; Pomona College, \$100,000; Rural Schools in the South—White and Colored, \$146,000; Farm Demonstrations and Boys' and Girls' Clubs, Maine, \$21,000; Farm Demonstrations and Boys' and Girls' Clubs, New Hampshire, \$10,000; Carlton College, \$100,000; Hobart College, \$50,000; Lafayette College, \$200,000; Kalamazoo College, \$25,000; Hampton Institute, \$25,000; University of Chicago, \$75,000; Stevens Institute of Technology, \$250,000. At the June meeting of the Board it was resolved to enter the field of educational investigation, research, and experiment by assisting research workers connected with institutions of learning, in addition to supporting independent investigators and experiments. In accordance with this resolution appropriations have been made for studying the school system of Gary, Ind., for investigating the training of teachers in high schools, investigation in beginning reading, study of the Hampton Institute system, and several other projects.

NEW PRESIDENTS. During 1915 the following college presidents were elected: Frank D. Blodgett, head of the department of pedagogy, Oneonta Normal School, was made president of Adelphi College; Dr. J. W. Cantwell was elected president of the Agricultural College, Stillwater, Okla.; Dr. Harry Means Crooks, president of Albany College, Oregon, was made president of Alma College, Alma, Mich.; John G. Bowman, formerly president of University of Iowa, was elected director of the American College of Surgeons; Dr. Rufus Von Kleiss Smid was made president of University of Arizona; Dr. Charles Wesley Flint was elected president of Cornell College, Iowa; Dr. Charles A. Prosser was made director of the William Hood Dunwoody Institute of Minneapolis; Dr. John Balcom Shaw was elected president of Elmira College; Rev. Joseph A. Mulry was made president of Fordham University; Dr. Ray Lyman Wilbur was elected president of Leland Stanford Jr. University; Dr. Edward C. Elliott, director of the School of Education, University of Wisconsin, was made chancellor of University of Montana. This is a new position created by the last Legislature. The chancellor is head of all State educational institutions, including the State University, Agricultural College, School of Mines, and State Normal School; Dr. A. Monroe Stowe was made president of Toledo University; Dr. Henry Suzallo, professor of sociology, Teachers College, Columbia University, was elected president of University of Washington; Dr. Ernest O. Holland, Superintendent of Schools, Louisville, Ky., was made president of Washington State Col-

lege; Dr. Carl G. Doney was elected president of Willamette University.

UNIVERSITY BUILDINGS. See ARCHITECTURE.

UPPER SENEGAL AND NIGER. One of the constituent colonies of the government-general of French West Africa. It extends from Senegal on the west to the northern part of Dahomey on the east, lying north of French Guinea, the Ivory Coast, the Gold Coast, and Togo. The estimated area is about 2,500,000 square kilometers. This includes the Saharan regions occupied by nomads. The area having a sedentary population with regular administration (limited by the 17th parallel) does not exceed 1,000,000 square kilometers. Of the population some 1100 are whites, almost entirely French. The number of Mohammedans is estimated at 1,405,000; of fetishists, at 5,598,000. The most numerous races are: Mossi, numbering about 1,797,000 (chiefly fetishist); Bambara, 672,000 (chiefly fetishist); Marka and Sarakollet, 272,000 (chiefly Mohammedan); Peuhl, 689,000 (chiefly Mohammedan); Gurinanche, 259,000 (fetishist); Bobo, 270,000 (fetishist). The capital is Bamako, the latest reported population of which is 7052; other important towns are Ouagadougou, 19,332; Kayes, 8952; Ségou, 8405; Sikasso, 7408; Timbuctoo, 6699; Djenné, 6699; Koudougou, 7052; Bondoukuy, 6310; Bobo-Dioulasso, about 5000. Grazing and agriculture are practiced. The natives raise large numbers of cattle, camels, horses, donkeys, and ostriches. Principal crops include rice, corn, groundnuts, millet, manioc, and tobacco. Cotton also is cultivated, and the natives are clever in manufacturing cotton cloth. The forests yield rubber, gums, and valuable timber. Imports and exports by way of Senegal were valued at 17,506,305 and 2,918,846 francs in 1911; in 1912, 9,803,799 and 3,422,410. Importations from the United Kingdom amounted to 3,171,706 francs in 1912; otherwise the trade is almost wholly with France. Principal exports in 1912: groundnuts, 1,049,442 francs; rubber, 866,087; hard gums, 555,813; corozo nuts, 358,290. There is also a considerable trade by way of French Guinea, the Ivory Coast, the Sahara, etc. A railway extends from Kayes to Koulikoro, 553 kilometers; it reaches the Niger at Bamako, kilometer 496. At kilometer 10 there is a branch of 2 kilometers to Médine. Westerly from Kayes a railway extends to Ambédi, 44 kilometers. Revenue and expenditure of the colony in 1911, 8,963,342 and 8,616,963 francs respectively; in 1912, 8,887,978 and 8,197,027. The colony is administered by a Lieutenant-Governor, under the Governor-General of French West Africa.

URANITE. See MINERALOGY.

URANIUM. See CHEMISTRY, INDUSTRIAL.

URUGUAY. A South American republic, bordering the Atlantic and the Río de la Plata, and bounded inland by Brazil and Argentina—officially *La República Oriental del Uruguay*. The capital is Montevideo.

AREA AND POPULATION. According to a recent planimetric calculation, the area of the 19 departments comprising Uruguay is 178,700 square kilometers (68,996 square miles). The area is commonly stated, however, at 186,925 square kilometers (72,172 square miles). Uruguay is the smallest of the South American republics, but its area is nearly as large as that of New Hamp-

shire, Vermont, New York, and Connecticut (73,074 square miles), or of non-Prussian Germany (74,161 square miles). The census of Oct. 12, 1908, returned a population of 1,042,688 (530,508 males, 512,178 females); estimate of Dec. 31, 1913, 1,315,714. It seems not unlikely that the latter figure somewhat exaggerates the actual number of inhabitants at the end of 1913. Of the total in 1908, 82.52 per cent were natives, and 17.38 per cent foreign-born. The foreigners included 62,357 Italians, 54,885 Spaniards, 27,789 Brazilians, and 18,600 Argentines. In 1908 the city of Montevideo had 291,465 inhabitants; its population at the end of 1914 was estimated at about 374,000. Paysandú had, in 1908, 20,953 inhabitants; Salto, 19,788; Mercedes, 15,667; Minas, 13,345; Melo, 12,355; San José, 12,297; Rocha, 12,200. Marriages in 1913 and 1914, respectively, 7330 and 6073; births (including still births), 40,315 and 38,571; deaths (including still births), 15,374 and 15,350; still births, 1463 and 1283; excess of births, 24,941 and 23,221; arrivals, 261,148 and 264,232; departures, 232,644 and 251,098. Of the living births in 1912, about 26 per cent were illegitimate.

Illiteracy, though common, is not so prevalent as in many other parts of South America. Primary instruction is nominally compulsory. In 1913, public primary schools numbered 976, with an enrollment of 91,746 pupils; there were also 238 private schools, with 21,874 pupils. Public primary schools in 1914 numbered 995, with 92,902 pupils. Rural public primary schools in 1913, 730; in 1914, 765. There are several secondary, normal, and special schools, and at Montevideo a university with faculties of mathematics, social sciences, law, medicine, veterinary medicine, agriculture, and commerce.

INDUSTRIES AND COMMERCE. The chief source of wealth is the grazing industry. In the number of sheep, Uruguay is seventh among the countries of the world; but in the average number of sheep per square mile, Uruguay is first. Without minimizing the importance of stock farming, the government realizes that the essential requirement of permanent national prosperity is cultivation of the soil, and hence it encourages agricultural endeavor; in 1915 the Congress authorized the President to expend 100,000 pesos for seed wheat to be resold to farmers at cost.

In 1900 and 1908 (year of the last live stock census), horses numbered 561,408 and 556,307, respectively; mules and asses, 22,992 and 22,099; cattle, 6,827,428 and 8,192,602 (milk cows in 1908, 565,854); sheep, 18,608,717 and 26,286,296; goats, 20,428 and 19,961; swine, 93,923 and 180,099. Domestic fowls, etc., in 1908 numbered 3,386,397, including 242,182 common and 690 African ostriches.

Below are shown the area, in hectares, of cereal crops and of linseed, the production in metric quintals, and the yield per hectare in the crop year 1913-14:

	Hectares		Quintals		Qs. Ha.
	1913-14	1914-15	1913-14	1914-15	
Wheat	368,846	815,000	1,602,277	980,000	4.8
Corn	280,284	845,000	1,814,229	2,920,000	6.5
Oats	39,484	38,531	268,530	150,890	6.8
Barley	5,686	1,782	35,846	8,019	6.3
Rye	184	89	1,179	312	6.4
Linseed	51,894	40,000	244,515	140,000	4.7

The foregoing figures for 1914-15 are preliminary.

Imports of merchandise for consumption and exports of domestic produce have been reported as follows, in thousands of pesos (par value of peso, \$1.03424):

	1908	1909	1910	1911	1912	1913
Imports	37,456	37,157	40,814	44,798	49,880	52,600
Exports	40,341	45,109	41,023	44,537	53,042	67,600

In 1912, about nine-tenths of the export value represented produce of the grazing and meat industry. Authentic details for the commerce of 1913 are not yet available. A law of 1915 prohibits, during the great war, the exportation of many articles, including metals and metal manufactures, medicines and industrial chemicals, and coloring materials, paints, and varnishes.

Shipping entered in 1914 totaled 13,641 vessels, of 12,092,482 tons (of which, steam, 8748 vessels, of 11,162,925 tons); cleared, 13,569 vessels, of 12,028,456 tons (steam, 8702, of 11,113,766 tons). The merchant marine in 1912 included 46 steamers, of 29,562 tons (net), and 165 sail, of 27,798 tons (net).

COMMUNICATIONS. The length of railway open to traffic at the end of 1914 is reported at 2577 kilometers, of which about 1700 kilometers were operated under state guarantee; under construction, 266 kilometers.

Telegraphs in 1913: 57 offices, with 4290 kilometers of line and 8600 kilometers of wire; radiotelegraph stations, 4, and 7 on board ship. Telephone wire in 1915, about 38,000 kilometers. Post offices in 1913, 995.

FINANCE. The standard of value in Uruguay is gold. The monetary unit is the peso, whose par value is \$1.03424. The budget for the fiscal year ended June 30, 1914, placed the revenue at 35,142,360 pesos and the expenditure at 35,133,812 pesos. The budget submitted to the congress for the fiscal year 1916 showed estimated revenue of 29,578,000 pesos and estimated expenditure of 29,477,311 pesos. Customs revenue was estimated at 12,500,000 pesos (customs revenue in the fiscal year 1915 was 11,367,700 pesos). The largest expenditure is on account of the public debt. This, at the end of 1913, amounted to 136,298,858 pesos, consisting of the foreign consolidated debt of 118,487,935 pesos, the international debt of 2,190,500 pesos, and the internal debt of 15,620,423 pesos.

ARMY. The establishment of compulsory service for all able-bodied men in the republic was under discussion during the year 1915, the basis being service with the active army at the age of 20 to 21, thus affording 6000 recruits each year, in addition to 7000 or 8000 professional soldiers, so that an active army of 13,000 or 14,000 men would be formed. Furthermore, the project contemplated the making available of 150,000 reservists, that is men between the ages of 17 and 50; while 50 batteries of 475 millimeter guns each would be established. This would give an army available for defense of 186,000 men, 284 guns, a corps of military aviators, fortification mines, submarines, and destroyers for defense of the coast.

GOVERNMENT. The General Assembly, or Congress, consists of the Senate and the House of Representatives. Each of the 19 departments is represented by a senator who is elected for six years by indirect vote. There are 90 representatives, elected for three years by direct vote. The

President is elected for four years by the General Assembly and is not eligible for the succeeding term. He is assisted by a responsible ministry of seven members. President for the term ended March 1, 1915, José Batlle y Ordóñez (he was President in 1903-07); for the term ending March 1, 1910, Feliciano Viera.

HISTORY. Dr. Feliciano Viera was elected President of Uruguay on March 1st and was inaugurated two days later. The cabinet which Dr. Viera appointed consisted of Dr. Manuel B. Otero, minister of foreign relations; Dr. Baltasar Brun, minister of interior; Dr. Pedro Cosío, minister of finance; Gen. Segundo Bazzano, minister of war and marine; Dr. Juan José Amezága, minister of commerce and industry; Dr. Juan Carlos Blanco, minister of public works; Dr. José Espalter, minister of education. The budget for 1915-16 as recommended by the President estimated the revenue at \$29,578,000 and the expenditure, \$29,477,311. On November 25th Señor Santiago Rivas succeeded Señor Blanco as minister of public works.

On January 25th President Wilson nominated as Minister to Uruguay Robert Emmett Jeffery of Newport, Ark., to succeed Nicolay A. Grevsted, resigned. Permission was given by the Federal Reserve Board in April to the National City Bank to establish in Montevideo a sub-branch of their bank at Buenos Aires. Americans felt that this bank would be a great boon to American trade in Uruguay. Already there was an encouraging gain in the trading in coal, twine, agricultural implements, automobiles, and electrical supplies. Uruguay appointed as delegates to the Pan-American Financial Congress at Washington Gabriel Ferra, Daniel Fortin, and Pedro Cosío, Minister of Finance.

USSINGITE. See MINERALOGY.

UTAH. POPULATION. The estimated population of the State on July 31, 1915, was 424,300. The population in 1910 was 373,351.

AGRICULTURE. The acreage, production, and value of the principal crops as estimated by the United States Department of Agriculture, in 1914-15, were as follows:

		Acreage	Prod. Bu.	Value
Corn	1915	18,000	442,000	\$354,000
	1914	12,000	420,000	815,000
Wheat	1915	320,000	8,225,000	7,074,000
	1914	291,000	7,275,000	6,256,000
Oats	1915	100,000	4,700,000	2,115,000
	1914	95,000	4,750,000	2,042,000
Rye	1915	13,000	202,000	181,000
	1914	13,000	228,000	137,000
Barley	1915	34,000	1,445,000	751,000
	1914	32,000	1,440,000	720,000
Potatoes	1915	20,000	2,500,000	1,575,000
	1914	20,000	2,800,000	1,680,000
Hay	1915	394,000	985,000	7,880,000
	1914	406,000	1,116,000	8,593,000

a Tons.

LIVE STOCK. The United States Department of Agriculture estimated that on Jan. 1, 1916, and Jan. 1, 1915, horses numbered 146,000 and 146,000, valued at \$12,556,000 and \$12,556,000; mules numbered 2000 and 2000, valued at \$156,000 and \$158,000; milch cows numbered 96,000 and 92,000, valued at \$5,952,000 and \$5,704,000; other cattle numbered 408,000 and 381,000, valued at \$14,606,000 and \$13,640,000; sheep numbered 2,089,000 and 2,068,000, valued at \$11,281,000 and \$9,306,000; swine numbered 112,000 and 98,000, valued at \$874,000 and \$1,000,000. The production of wool in 1915 and 1914

was 13,100,000 and 13,320,000 pounds respectively.

MINERAL PRODUCTION. The total production of gold in the State in 1914 was \$3,265,347, compared with \$3,565,229 in 1913. The silver output was 11,154,916 fine ounces, valued at \$6,168,669, compared with 13,084,831 ounces, valued at \$7,903,240, in 1913. Utah ranks fourth in the Union in the value of copper produced. In 1914 the production amounted to 152,034,602 pounds, valued at \$20,220,522, compared with 161,445,962 pounds, valued at \$25,024,124 in 1913. With the exception of 1913 the coal production of 1914 was higher than any other previous year. The production in 1914 was 3,103,036 short tons, valued at \$4,935,454. This was less than the production of 1913 by 141,792 short tons. Notwithstanding the decrease in the total production for the year the amount of coal made into coke shows an increase of 32,224 tons. The amount of lead produced in 1914 was 85,662 short tons, valued at \$6,681,602, compared with 83,063 tons, valued at \$7,309,579 in 1913. The value of the total mineral production in 1914 was \$45,624,698, compared with \$53,606,520 in 1913.

EDUCATION. The total school population in 1915 was 117,632. There were enrolled in the public schools 96,674 pupils, with an average daily attendance of 79,173. The male teachers numbered 719, and the females 2040. The total expenditures for the year amounted to \$4,574,085.

TRANSPORTATION. The railway mileage in the State in 1915 was 2354 miles of main track. The railways having the longest mileage are the Denver and Rio Grande, 762; the Central Pacific, 273; the Oregon Short Line, 242; the San Pedro, Los Angeles, and Salt Lake, 498; the Western Pacific, 121; the Union Pacific, 75. There was very little railway construction during the year.

FINANCE. The total receipts from all sources for the fiscal year ending Nov. 30, 1915, amounted to \$4,358,004. The total disbursements for the period amounted to \$4,889,893. There was a balance on hand Nov. 30, 1914, of \$1,366,482, leaving a balance on Nov. 30, 1915, of \$834,953. The principal items of expenditure include the maintenance of the State University, Agricultural College, State Industrial School, State Mental Hospital, State Prison, State Capitol, and State School for the Deaf and Blind. Large amounts are also expended during the year for State roads and interest on the bonded debt, which, at the close of the year, amounted to \$3,060,000.

CHARITIES AND CORRECTIONS. The charitable and correctional institutions include the State Industrial School, State Mental Hospital, State Prison, and the State School for the Deaf and Blind.

POLITICS AND GOVERNMENT. A State-wide prohibition bill which had previously passed the Senate, was passed in the House by a vote of 40 to 5 on March 2nd. The prohibition measure was vetoed by the Governor, following the adjournment of the Legislature. There was, however, placed on the statute books a law modeled after the Webb-Kenyon law, imposing heavy penalties for the shipment of liquor from wet to dry territory in the State. A law was enacted requiring all mercantile establishments, except those handling food and drugs, to close at

6 P.M., except during the week before Christmas. The Legislature created a commissioner to investigate the question of workmen's compensation, and report a bill for the consideration of the next Legislature.

A threatened uprising among the Piute Indians in Utah was averted by the prompt action of the United States government in sending Gen. Hugh L. Scott, chief of staff, to adjust the difficulty. The trouble arose through the alleged murder of Juan Chacon, a Mexican, on the Piute reservation, by an Indian named Tee-Ne-Gat, or Everett Hatch, as he was otherwise known. Hatch was indicted by the Federal Grand Jury on October, 1914, but he resisted arrest and escaped. He gathered a band of Indians and took to the hills. His father, known as "Old Polk," gathered another band of 50 or more armed Piutes, which joined Hatch's forces. A posse of 20 from Denver and another force from Salt Lake City endeavored to capture Hatch, and in a fight outside of Bluff, Utah, on February 22nd, 2 Indians were killed and 6 taken prisoner. One white man lost his life and two were wounded. The fighting continued for three days without any advantage on either side. Reinforcements were summoned. On February 24th Hatch escaped. Commissioner Sells, of the Indian Bureau, gave instructions to employ all possible means to induce the hostile Piutes to avoid the loss of more lives. General Scott, in whom the Indians have the greatest confidence, was sent to plead with them, and on March 20th he returned to Bluff with "Old Polk," Hatch, and several other Indians. This was accomplished by peaceful means, and ended the rebellion. Hatch was tried in the Federal Court, and was acquitted on the charge of murder on July 15th.

STATE GOVERNMENT. Governor, William Spry; Secretary of State, D. Mattson; Treasurer, J. D. Jewkes; Auditor, L. G. Kelly; Attorney-General, A. R. Barnes; Adjutant-General, E. A. Wedgwood; Superintendent of Education, E. G. Gowans; Commissioner of Insurance, John James—all Republicans.

JUDICIARY. Supreme Court: Chief Justice, Daniel N. Straup; Justices, J. E. Frick and W. M. McCarty; Clerk, H. W. Griffith.

STATE LEGISLATURE:

	Senate	House	Joint Ballot
Republicans	11	28	34
Democrats	4	9	13
Progressives	2	13	15
Socialists	0	1	1
Republican majority	5	0	5

UTAH, UNIVERSITY OF. A State institution for higher education, founded in 1850, at Salt Lake City, Utah. The attendance in all departments in the autumn of 1915 was 1327. The faculty numbered 105. There were no notable changes in the faculty during the year, and no noteworthy benefactions were received. The university is supported chiefly from income from land funds, and by State appropriations. The library contains 42,690 volumes. The president is J. F. Kingsbury, Ph.D.

VACCINATION. See SMALLPOX.

VACCINES. See CHOLERA.

VACCINE THERAPY. Occasionally a severe reaction occurs at the site of an ordinary vaccination to prevent smallpox, and a ragged

ulcer results. This is often due to careless scratching with dirty finger nails, which introduces in rare instances, tetanus germs. It is most frequent in children who have ripped off the protective dressing applied by the physician. But in a few instances it is due to the presence of extraneous organisms, non-spore-bearing bacteria. To get rid of these, Noguchi has carried on a series of experiments culminating in success in 1915. He has cultivated vaccine virus through 60 generations in the testicle of the rabbit, and has obtained a bacteria-free virus. The idea of cultivation of vaccine *in vivo* originated with Henseval and Convent, of Belgium, who carried on similar experiments with the testicles of bulls in 1910. The cost of the rabbit vaccine is a trifle less than that of the calf.

Vaccine therapy in typhoid fever has recently been reviewed by Krumbhaar and Richardson of Philadelphia, and favorable results are shown in 95 per cent of the cases. In a series treated by Petrowitch the mortality was 3.2 per cent, as compared with 8 per cent in unvaccinated patients. Not only is the vaccine useful as a preventive, but Krumbhaar regards it as a good routine treatment of the diseased patient. Gay and Claypole suggest that a hyperleukocytosis follows the injection of the virus, which forms a good theoretical basis for its use.

Research work of 1915 included the preparation and use of pertussis stock vaccine, which has apparently a high prophylactic value in whooping cough, which causes the death of 10,000 American children annually. The pertussis vaccine has shortened the duration of the paroxysmal stage from 40 to 25 days, and mitigated its severity.

Casselman, of Camden, N. J., reaches the conclusion, based on experiments, that vaccines should not be heated over 37 C., but that their vegetative powers should be destroyed by some method which does not change their immunity reactions from those of living bacteria. He suggests the use of a 0.25 per cent tricesol solution for 24 hours at 37 C.

VALPARAISO UNIVERSITY. An institution for higher education, founded in 1873 at Valparaiso, Ind. The total attendance in the autumn of 1915 was about 6000. The instructors numbered 218. There were no notable changes in the faculty during the year, and no noteworthy benefactions were received. The library contained about 17,500 volumes. The president was Henry B. Brown, A.M.

VAN AMRINGE, JOHN HOWARD. American educator, died Sept. 10, 1915. He was born in Philadelphia in 1835, and graduated from Columbia College in 1860. The same year he was appointed tutor of mathematics. He became adjunct professor in 1863, full professor in 1865, and professor emeritus in 1910. From 1892-1910 he was head of the department of mathematics, and from 1894-96 he was dean of the School of Arts. He was dean of Columbia College from 1896-1910, and in 1899 served as president pro tempore. He was for 50 years a member of the faculty of Columbia University, and for more than 20 years dean. He was a scholar of the older type, and through his popularity and influence was a strong factor in university affairs. He belonged to many learned and other societies, and wrote pamphlets on vital statistics, life insurance, and similar subjects. He also wrote a history of Columbia College and

University, and many articles and addresses relating thereto.

VANDERBILT UNIVERSITY. An institution for higher education, founded in 1872 at Nashville, Tenn. The total enrollment in all departments in the autumn of 1915 was about 1000. The faculty numbered 125. During the year Dr. James F. Morris was appointed professor of chemistry, and Dr. E. E. Reinke was appointed assistant professor of biology. The productive funds amounted to \$250,000. The annual income to about \$270,000. The library contains 58,000 volumes. The president in 1915 was Henry B. Brown, A.M.

VAN HORNE, SIR WILLIAM COENELIUS. Canadian financier, died Sept. 11, 1915. He was born in Joliet, Ill., in 1843, and in 1856 at the time of his father's death was obliged to work as an office boy in a local railroad station. A year later, at the age of 14, he became a telegraph operator on the Illinois Central Railroad. He was connected at various times with the Illinois Central, Michigan Central, Chicago and Alton, and other important railroads, and became known as one of the leading authorities on railroad matters. From 1881, when he was made general manager of the Canadian Pacific Railway, until his death, he was the dominating figure in Canadian transportation. Largely through his efforts a great railroad system extending throughout Canada and the Northern States of the United States, and a Pacific steamship system reaching from China and Japan were completed. He was for many years president and chairman of the board of the Canadian Pacific Railroad. He resigned from the last position in 1910, but remained a director of the company until his death. After he had completed the larger part of his work in Canada, he turned his attention in the late nineties to the development of Cuba, and constructed that country's largest railway system. This was operated by the Cuba Company, of which he was the president. Aside from the Canadian Pacific, his interests in Canada covered many activities, including farming, forestry, mining, and the manufacture of paper pulp and steel. In all these he amassed a large fortune. In addition to his activities as railroad official and financier, he found time to become a practical engineer, electrician, surveyor, geologist, botanist, painter, and antiquarian, and a student of art, literature, and history. His collection of paintings and rare books was one of the best in Canada. He was knighted by Queen Victoria for his work in developing railways in Canada.

VANNUTELLI, SERAFINO. Italian Roman Catholic cardinal, died Aug. 19, 1915. He was born in the village of Genazzano, Italy, in 1834, and was a member of one of the most distinguished families of that country. He was a brother of Vincenzo Vannutelli, who was also a cardinal. At the age of 17 Serafino went to Rome to pursue his studies. He there decided to enter the priesthood. At the suggestion of Pope Pius IX, he entered the College Capranica, and he here distinguished himself in various branches, principally in philosophy and natural science, and also obtained degrees of doctor of theology and jurisprudence. He was appointed canon to St. Peter's, and shortly afterwards succeeded his brother Vincenzo, as professor of theology at the Vatican Seminary. He resigned both these offices in 1864 in order to accompany

the newly appointed nuncio to Mexico. He remained in that country until the death of Emperor Maximilian, after which he accompanied the nuncio on his mission to the United States. During this visit he conceived an admiration for American people and institutions, which continued throughout his life. On his return to Italy he was sent to Munich and afterwards to Peru in a diplomatic capacity. In 1869 he went to Brussels as secretary to the delegate at that post. Three years later he was sent to Vienna, and the year following returned to Belgium as nuncio. While holding this post, he achieved a high reputation for tact and diplomacy. When, on account of the education question, diplomatic relations between Belgium and the Holy See were temporarily suspended, he was appointed nuncio at Vienna. There he won such popularity and dealt so successfully with religious and lay controversies that request was made that he be made cardinal. At the Consistory held on March 14, 1887, this was done. In 1893 he was nominated Cardinal Archbishop of Bologna. He was considered the most probable successor to the papacy on the death of Pope Leo XIII. In 1903, on the death of Cardinal Bishop Oreglia, Vannutelli became Dean of the Sacred College. In this office he was the senior counselor of two pontiffs. After the death of Pope Pius X, and prior to the election of the present Pope, he was the senior of the four cardinals highest in Church councils. In 1913 both he and his brother retired to voluntary exile from Rome. It was reported that this was the result of the rise in power of Cardinal Merry del Val, Papal Secretary of State under Pius X.

VASSAR COLLEGE. An institution for the higher education of women, founded in 1861 at Poughkeepsie, N. Y. The total enrollment in all departments in the autumn of 1915 was 1120. The faculty numbered 138. Prof. Burges Johnson was appointed to the chair of English, and Prof. Durant Drake to the chair of philosophy. In October the college celebrated with appropriate ceremonies the 50th anniversary of its founding. The productive funds at the end of the fiscal year amounted to \$1,641,125, and the income at the end of the fiscal year ending 1915 was \$349,000. The library contained about 86,000 volumes. The president in 1915 was Henry Noble MacCracken.

VENEREAL DISEASES. See PROSTITUTION.

VENEZUELA. A republic on the northern coast of South America, between Colombia and British Guiana. Capital, Caracas.

AREA AND POPULATION. The estimated area is 1,020,400 square kilometers (393,976 square miles), an area somewhat larger than Arkansas, Oklahoma, and Texas, which total 389,288 square miles. The population, as estimated for March 31, 1915, was 2,812,668. It is not unlikely that this figure exaggerates the actual number of inhabitants. Marriages in 1913 and 1914, respectively, 9863 and 7492; births, 76,588 and 75,817; deaths, 52,847 and 51,697; immigration, 11,536 and 10,610; emigration, 10,681 and 9742. The birth rate at Caracas in 1913 was 24.99, and the death rate 38.47. Urban populations are variously estimated. Caracas is supposed to have about 80,000 inhabitants, Maracaibo 50,000, and Valencia 40,000.

Primary instruction is nominally compulsory, but illiteracy is prevalent. At the end of 1912,

there were 1408 schools, with 45,515 pupils enrolled, including 118 private schools, with 5280 pupils. These schools are officially reported as "one-teacher" schools. In addition, graded schools, generally with six teachers, numbered 52, with an enrollment of 7099. The average attendance in the one-teacher schools was only 32,415, and in the graded schools 4853. Of the 45,515 pupils enrolled in the one-teacher schools, 21,270 were illegitimate children. The state religion is Roman Catholicism. The country is divided into 412 parishes, with (in 1912) 477 churches and chapels and 428 priests.

PRODUCTION AND COMMERCE. Cultivated crops include coffee, sugar cane, cacao, and cereals. The forests yield rubber, balata, copaiba, and vanilla. Large mineral deposits exist, but gold, copper, asphalt, salt, petroleum, and iron are the only minerals worked in commercial quantities. Imports and exports have been valued as follows, in thousands of dollars:

	1905	1910	1911	1912	1913	1914
Imports	8,539	12,238	18,395	20,569	18,030	13,987
Exports	13,154	17,949	22,684	25,261	29,484	21,521

In the years 1912-13 and 1913-14, the principal exports were valued as follows, in bolivars: coffee, 78,702,479 and 74,679,745; cacao, 12,009,555 and 22,804,201; rubber and balata, 12,344,129 and 8,085,729; hides, 10,668,177 and 10,167,105; cattle, 1,067,291 and 3,391,579; gold, 6,131,345 and 2,425,644. The coffee export in 1913-14 amounted to 62,876 metric tons; rubber and balata, 1743; cacao, 17,798; raw sugar, 3163; tonka beans, 155. Trade by countries, in thousands of dollars:

	Imports		Exports	
	1913	1914	1913	1914
United States	6,944	6,015	8,476	9,879
United Kingdom	4,296	2,893	2,208	1,427
Germany	2,587	1,590	5,564	1,980
France	1,094	778	9,988	6,019

Total, including other 18,030 13,987 29,484 21,521

In 1914 there were entered at the ports 1089 vessels, of 1,057,878 tons.

COMMUNICATIONS. The country is very inadequately supplied with roads and railways, but there are some 11,000 miles of navigable river. The railways extend from coastal points into the interior, but are not connected to form a system. In 1914 there were 12 railways in operation, aggregating 960 kilometers (597 miles); 5 of the lines are national, and 7 foreign.

Telegraphs in 1914, 211 offices, with 8780 kilometers of line; telephones in 1914, 6900 kilometers of line and 20,930 kilometers of wire; post offices in 1914, 296.

FINANCE. The standard of value is gold. The monetary unit is the bolivar, whose par value is equivalent to the franc, or 19.295 cents. Revenue and expenditure in the fiscal year 1914-15 were 60,370,993 and 64,873,598 bolivars, respectively. For the fiscal year 1915-16, the budget balanced at 39,594,500 bolivars. Estimated receipts included customs, 10,700,000 bolivars, and stamps and taxes on salt, spirits, and cigars, 14,775,000. The larger estimated disbursements were: finance and the public debt, 12,881,744 bolivars; war and marine, 9,535,147; interior, 8,895,702; fomento, 2,563,710; public instruction, 2,252,073. Public debt, Dec. 31,

1914: foreign, 112,105,296 bolivars; internal, 60,631,834; total, 172,737,130.

GOVERNMENT. Under the constitution bearing date of June 19, 1914, the Congress consists of a Senate and a Chamber of Deputies. Senators are 40 in number, elected for three years by the legislative assemblies of the several states. Deputies are chosen by direct vote for three years, one deputy for each 35,000 inhabitants. The executive authority is vested in a President, elected by the Congress for seven years.

HISTORY. *Presidency of Juan Gomez.* On May 3rd the National Congress of Venezuela by unanimous ballot elected Gen. Juan Vicente Gomez President of the republic for a term extending from 1915 till April 19, 1922. Gomez was first vice-president when Cipriano Castro held office, and succeeded to the presidency when the latter retired in 1909. In April, 1910, Gomez was elected President for a term of four years, and in 1914 he was succeeded by Gen. V. Márquez Bustillos. He was appointed commander-in-chief of the Venezuelan army at this time, and held the post till elected President on May 3rd. In June and July Congress passed several important laws, including statutes regulating the transfer of real property, public credit, revenue, public instruction, certificates and official titles, public registry, elections, and the tariff. In July the government announced that the imports for 1914 totaled \$13,987,465, while the exports equaled \$21,520,534. The budget for 1915-16, as announced in August, balanced the expenses and receipts at 39,594,500 bolivars, or \$7,641,738.50.

Collapse of Revolution. Late in August advices reaching Curacao stated that the revolt which had been begun in September, 1914 (see 1914 YEAR BOOK), in the eastern part of Venezuela had been crushed. General Du Charmé, the revolutionary leader, was captured by government troops after a battle at Maturin, August 23rd, and was executed without trial. The revolutionary movement had been carried on under the name of Gen. José Manuel Hernandez ("El Mocho") for a year before the Gomez government was able to suppress it in August. With the defeat of the revolutionists, guerilla bands sprang up in the eastern states, offering much trouble to the government forces and terrorizing the district.

VERMONT. **POPULATION.** The estimated population of the State on July 31, 1915, was 362,452. The population in 1910 was 355,956.

AGRICULTURE. The acreage, production, and value of the principal crops, as estimated by the United States Department of Agriculture, in 1914-15, were as follows:

		Acreage	Prod. Bu.	Value
Corn	1915	47,000	2,256,000	\$1,895,000
	1914	45,000	2,115,000	1,713,000
Wheat	1915	1,000	80,000	82,000
	1914	1,000	29,000	29,000
Oats	1915	81,000	3,483,000	1,846,000
	1914	79,000	3,858,000	1,847,000
Rye	1915	1,000	17,000	14,000
	1914	1,000	20,000	18,000
Barley	1915	12,000	420,000	315,000
	1914	12,000	414,000	310,000
Potatoes	1915	24,000	2,592,000	2,100,000
	1914	25,000	4,200,000	1,974,000
Hay	1915	970,000 a	1,810,000	20,805,000
	1914	990,000	1,188,000	17,845,000
Tobacco	1915	100	130,000	14,000
	1914	100	170,000	31,000

a Tons. b Pounds.

LIVE STOCK. The United States Department of Agriculture estimated that on Jan. 1, 1916, and Jan. 1, 1915, horses numbered 89,000 and 88,000, valued at \$11,570,000 and \$11,528,000; milch cows numbered 273,000 and 268,000, valued at \$14,742,000 and \$13,936,000; other cattle numbered 170,000 and 167,000, valued at \$3,961,000 and \$3,858,000; sheep numbered 100,000 and 105,000, valued at \$590,000 and \$536,000; swine numbered 113,000 and 108,000, valued at \$1,164,000 and \$1,404,000. The production of wool in 1915 and 1914 was 571,000 and 589,000 pounds, respectively.

MINERAL PRODUCTS. Stone is the only important mineral product of Vermont. In 1914 the value of the output was \$6,635,477, compared with \$7,313,355 in 1913. The value of the total mineral product in 1914 was \$8,665,867, compared with \$9,647,985 in 1913.

TRANSPORTATION. The total railway mileage in the State on July 30, 1913, was 1080. Railways having the longest mileage were the Rutland Railway Company, the Central Vermont, and the Boston and Maine. There was no construction of railway track in 1914 or 1915.

EDUCATION. The total enrollment in the public schools in 1915 was 65,095. The teachers numbered 3018. The total expenditures for the year were \$2,325,214.

FINANCE. The total receipts for the fiscal year ending July 12, 1915, amounted to \$1,876,652. There was a balance on hand on July 1, 1914, of \$252,721. The disbursements during the period amounted to \$1,916,680, leaving a cash balance on hand, July 12, 1915, of \$212,693.

CHARITIES AND CORRECTIONS. The institutions under the control of the State include the State Penitentiary at Windsor, House of Correction at Rutland, Industrial School at Vergennes, State Asylum for the Insane at Waterbury, Soldiers' Home at Bennington, and the Vermont Sanatorium at Pittsford. There are also 10 hospitals under State control. There is no board of charities in the State.

POLITICS AND GOVERNMENT. C. W. Gates was inaugurated Governor of the State on January 7th. In his inaugural address he discussed at length the relations and responsibilities of the different departments of the State government, and their attitude toward the people. The Legislature on March 22nd passed an act providing for eugenic marriages. A fine of \$500 was fixed for any person who should marry outside the requirements of the law.

In the voting on March 2nd, 4 cities in the State were gained for prohibition; 16 towns and cities out of a total of 246 voted for licenses. On February 12th a bill passed the Senate extending the franchise to women in the town and city elections, and for presidential electors. It was defeated in the House. The Legislature voted to submit a prohibition law to the people at the municipal election in the spring of 1916. The measure proposed forbids the sale of liquor even for medical purposes. A workmen's compensation law was passed.

STATE GOVERNMENT. Governor, Charles W. Gates; Lieutenant-Governor, Hale K. Darling; Secretary of State, Guy W. Bailey; Treasurer, Walter F. Scott; Auditor, Horace F. Graham; Adjutant-General, Lee S. Tillotson; Attorney-General, Herbert G. Barber; Commissioner of Education, U. S. Stone; Commissioner of Agriculture, E. S. Brigham—all Republicans.

JUDICIARY. Supreme Court: Chief Justice, Loveland Munson; Associate Justices, John H. Watson, William H. Taylor, Seneca Haselton, George M. Powers; Clerk, L. C. Moody.

STATE LEGISLATURE:

	<i>Senate</i>	<i>*House</i>	<i>Joint Ballot</i>
Republicans	80	175	205
Democrats	..	80	80
Progressives	..	24	24
Republican majority..	80	121	151

* House also had 14 additional members. Political affiliations not stated.

VERMONT, UNIVERSITY OF. A State institution for higher education, founded at Burlington, Vt., in 1791. The attendance in all departments in the autumn of 1915 was about 600. The faculty numbered about 100. No noteworthy benefactions were received during the year, and there were no notable changes in the faculty. The productive funds amounted to about \$250,000. The library contained 92,000 volumes. The president was Guy Potter Benton, D.D.

VETERINARY MEDICINE. At the annual meeting of the American Veterinary Medical Association held at Oakland, Cal., from August 30th to September 2nd, 1915, R. A. Archibald was elected president; V. A. Moore, R. W. Ellis, A. Eichhorn, C. D. McGilvray, and G. H. Hart, vice-presidents; F. H. Schneider, treasurer; and C. M. Haring, secretary. A plan for reorganization was rejected by the members present, who, however, adopted a new standard for entrance requirements. The acquisition of an official publication was authorized at this meeting, which resulted in the purchase of the *American Veterinary Review*. This publication, the oldest veterinary journal published in America, after having completed its 47th volume was transferred the 1st of October, and became the *Journal of the American Veterinary Medical Association*. Dr. Pierre A. Fish of the New York State College of Veterinary Medicine was elected by the committee in charge and accepted the editorship of the new journal, three numbers of which were issued before the close of the year, the first from New York City, following which the transfer of the publishing and editorial departments to Ithaca was made.

The Secretary of Agriculture emphasized the fact that the meat supply of the country can easily be materially increased by controlling or eliminating the common live stock diseases, the direct losses from which are enormous while the indirect losses can not be estimated at all. It was conservatively estimated on the basis of data for 30 years that the annual direct losses from animal diseases are approximately \$212,000,000, distributed as follows: Hog cholera, \$75,000,000; Texas fever and cattle ticks, \$40,000,000; tuberculosis, \$25,000,000; contagious abortion, \$20,000,000; blackleg, \$6,000,000; anthrax, \$1,500,000; scabies of sheep and cattle, \$4,600,000; glanders, \$5,000,000; other live stock diseases, \$22,000,000; parasites, \$5,000,000; and poultry diseases, \$8,750,000.

FOOT-AND-MOUTH DISEASE. The work of eradicating the foot-and-mouth disease, which first appeared in Michigan in October, 1914, was pressed with great vigor under the appropriation of \$2,500,000. After months of work the outbreak was brought under control, its spread was

checked, and there was a steady diminution in the number of cases until June 18th, when the last herd known to be infected at that time had been slaughtered and buried and the premises disinfected. On July 28th, however, it was discovered in Steuben County, N. Y., and seven herds were slaughtered. Again, on August 8th, it appeared at Wheeling, Cook County, Ill., and shortly afterwards a diseased herd was found in each of the States of Indiana and Minnesota. In October it appeared at Leicester, Mass., but by November 10th, it had been eradicated in every State but Illinois, where 11 counties had been reinfected and the slaughter of some 400 herds was made necessary. Subsequent investigations have shown the outbreak at Wheeling to have been produced by contaminated hog cholera serum prepared in Chicago in October, 1914, at an establishment where the disease had not been known to exist at any time. Twenty-one States and the District of Columbia had been invaded by the scourge up to the close of the fiscal year ended June 30th; 152,157 head of afflicted or exposed animals, distributed in 3021 herds on 2707 premises, had been slaughtered, of which 69,742 were cattle, 73,574 were swine, 8742 were sheep, and 99 were goats. The total appraised value of these animals amounted to \$5,243,138.55, while the disposal of the carcasses cost a total of \$156,049.22 and property to the value of \$22,158.51 was destroyed in disinfection. One-half of these amounts and the salaries and expenses of inspectors were paid by the Federal Department of Agriculture.

The disease in an exceedingly mild form spread rapidly among the National Dairy Show cattle, all but 7 of the 719 animals proving to be susceptible to it. None of these animals succumbed to the disease, although 75 per cent of the calves that were born while the cows were affected died. While the udders of many of the cows were affected, but six cows lost one or more quarters. After thorough tests had proved that they did not harbor the affection, they were released on May 31st, having been kept in quarantine for seven months at an expense per head which amounted to several times the average value of farm cattle. The agricultural appropriation act authorized the Secretary of Agriculture to reimburse the owners of this herd to the extent of one-half of the expense incurred on account of the quarantine, the total expense not to exceed one-half of the beef or dairy value of such cattle.

SPLENETIC OR TEXAS FEVER AND TICK ERADICATION. The slogan "Dip the Tick" was adopted by the Federal Department of Agriculture for a special campaign against the cattle tick, a parasite which costs the South more than \$40,000,000 each year. Two-color posters were displayed in every post office in the tick-infested country, and circulars and leaflets profusely illustrated with halftone cartoons and diagrams emphasizing the importance of tick eradication were prepared for broadcast distribution to farmers in the South. The work of tick eradication conducted by the Federal Department of Agriculture in coöperation with the State authorities was prosecuted with vigor under an appropriation of \$438,800 and was making possible a fuller development of the cattle industry in the South. With the release on December 1st of 12,313 square miles, an aggregate of some 50,000 square miles had been released, making a total area of 275,

782 released since the work was commenced in 1906, or more than one-third of the original area. Cattle dipping vats to the number of 6678 were in operation where cattle were dipped under Federal or State supervision to rid them of ticks and 11,268,668 inspections were made of cattle for ticks.

HOG CHOLERA. Field experiments, demonstrations, and educational and preventive work were carried on during the year under the appropriation made by Congress. The use of properly prepared serum had a pronounced effect. Systematic eradication work conducted in 16 counties in nearly as many States showed that whereas 178 hogs in 1000 died from cholera in 1912 and 169 in 1913, only 49 in 1000 died in 1914. But 62,690 died in these counties in 1914, as compared with approximately 200,000 in each of the two years preceding. The results of the work indicate that the eradication of hog cholera from the United States, if it can ever be accomplished, must be a work of many years. During the year 80 places were licensed to manufacture anti-hog-cholera serum and hog-cholera virus.

DOURINE. Good progress was made in the eradication work with dourine carried on during the year in Montana, Nebraska, North and South Dakota, Wyoming, and on the Navajo Indian Reservation in Arizona and New Mexico. In the course of this work 52,896 samples of blood were tested, of which 1515 or 2.7 per cent gave positive reactions, most of the positives coming from other sections than those covered during the previous year.

TUBERCULOSIS. Studies of tuberculosis in progress for a number of years led the Federal Bureau of Animal Industry to the conclusions (1) that its propagation among cattle depends more largely on actual contact between tuberculous and healthy cattle than on any other possible cause of infection; (2) that no wide separation between stables and pens occupied by tuberculous and healthy herds of cattle is necessary to protect the latter against infectious material discharged by the former; (3) that a thorough cleaning of an infected stable in preparing it for a healthy herd is a factor of possibly even greater importance than the use of disinfectants; and (4) that tuberculosis among hogs depends almost exclusively on their direct exposure to tuberculous cattle and to material derived from such cattle, and only very slightly on the exposure of healthy to tuberculous hogs.

ANTHRAX. In an experimental preparation of an immune serum to be used in connection with the spore vaccine for the immunization of animals against anthrax the Federal Bureau of Animal Industry met with considerable success, having proved the effectiveness of the simultaneous method of vaccination beyond a doubt. The serum was also found to have a considerable curative value.

BACILLARY WHITE DIARRHEA OF CHICKS. It was found possible by means of the macroscopic agglutination test of the blood for *Bacterium pullorum* to remove infected fowls from breeding flocks. Such testing was successfully carried on by the Connecticut Experiment Station and was commenced by the Massachusetts Experiment Station.

RABIES. A serious wave of rabies infection of wild and domesticated animals, particularly of coyotes, which threatened to become widespread in the Northwest, led the Federal De-

partment of Agriculture to start control work in Northern California in coöperation with the State authorities.

TRICHINOSIS. Further investigations led to the discovery that refrigeration at a temperature not higher than 5° F. for a period of 20 days is effective in destroying *Trichinella spiralis* in pork.

SOABIES. During the course of the work of eradicating parasites causing scabies 15,659,624 sheep were inspected, of which 3,790,967 were dipped; 1,264,009 cattle were inspected, and 588,228 dipped; and 3105 horses were inspected, of which 2682 were dipped.

OX WARBLES. Investigations reported by Carpenter and his assistants in Ireland and later confirmed by Hadwen in Canada show that *Hypoderma bovis* may enter its host by penetrating the skin.

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VICTORIA. A state of the Commonwealth of Australia, bounded by New South Wales on the north and South Australia on the west. The area is 87,884 square miles. Population, according to the 1911 census, 1,315,551, exclusive of full-blooded aborigines; 1914 estimate, 1,430,667.

The capital is Melbourne, which is also the temporary capital of the Commonwealth; its population, including suburbs, was 588,971 in 1911. The executive authority is vested in a Governor appointed by the crown and aided by an executive council of 12 members. There is a Parliament consisting of two Houses—the Legislative Council of 34 members, elected for the 17 provinces for six years, and the Legislative Assembly of 65 members, elected for three years. There is universal adult suffrage. Governor in 1915, Sir Arthur Lyulph Stanley; Lieutenant-Governor, Sir J. Madden; premier, treas-

urer, and minister of labor, Sir Alexander James Peacock. See AUSTRALIA.

RAILWAYS. The government railways of Victoria during the year 1915 suffered from diminished returns due to a lessened traffic and war conditions generally. The causes assigned were reduction in schedule rates for starving stock, fodder, and seed-wheat, as well as for military men, animals, and equipment for the expeditionary forces carried at one-half full rates, for increased material for road making for which a low rate was made, and an unusually large and unproductive train mileage due to drought, and the reduction in tonnage of freight. As the result of the decreased revenue and the increase in working expenses due to the payment of higher wages, passenger fares and freight rates were increased and these higher rates came into operation on October 1st, from which an increase of £260,000 it was hoped would be secured. There were on June 30, 1915, 3875 miles of line open for traffic as compared with 3835 miles on June 30, 1914.

Progress on the electrification of the Melbourne suburban railways was considerably retarded by the abnormal conditions due to the war. Accordingly it was not possible to give any indication of the probable date of the introduction of electric traction.

HISTORY. In March the Victorian Rifle Association raised a special corps of sharpshooters for the front. Late in April the State of Victoria invited subscriptions in London to a loan of £2,250,000 to be used in the construction of railways. The money raised was to be entirely expended in Great Britain in the purchase of supplies. London capitalists subscribed to the full amount of the loan. Difficulties with German mining interests in Victoria in August caused the introduction of a bill providing for the cancellation of all contracts with German capitalists and the reorganization of several of the mining companies so as to exclude German capital.

VILKITZKY'S EXPLORATIONS. See EXPLORATION; and POLAR RESEARCH.

VILLA, FRANCISCO. See MEXICO, *History*.

VIRGINIA. **POPULATION.** The estimated population of the State on July 31, 1915, was 2,171,014. The population in 1910 was 2,061,612.

AGRICULTURE. The acreage, production, and value of the principal crops, as estimated by the United States Department of Agriculture, in 1914-15, were as follows:

		<i>Acreage</i>	<i>Prod. Bu.</i>	<i>Value</i>
Corn	1915	2,125,000	60,562,000	\$42,999,000
	1914	1,921,000	39,380,000	81,898,000
Wheat	1915	1,280,000	16,974,000	18,332,000
	1914	779,000	11,296,000	12,200,000
Oats	1915	225,000	5,625,000	8,094,000
	1914	191,000	2,960,000	1,717,000
Rye	1915	70,000	1,015,000	944,000
	1914	58,000	754,000	679,000
Barley	1915	12,000	348,000	261,000
	1914	11,000	286,000	229,000
Potatoes	..1915	140,000	17,500,000	10,675,000
	1914	112,000	7,280,000	5,606,000
Hay	1915	700,000	a 945,000	14,836,000
	1914	650,000	468,000	8,050,000
Tobacco	...1915	192,000	b 144,875	13,571,000
	1914	175,000	118,750	10,238,000
Cotton	1915	36,000	c 16,000	870,000
	1914	45,000	25,000	880,000

a Tons. b Pounds. c Bales.

LIVE STOCK. The United States Department of Agriculture estimated that on Jan. 1, 1916,

and Jan. 1, 1915, horses numbered 361,000 and 354,000, valued at \$35,739,000 and \$38,586,000; mules numbered 64,000 and 62,000, valued at \$7,680,000 and \$7,936,000; milch cows numbered 359,000 and 349,000, valued at \$14,898,000 and \$15,182,000; other cattle numbered 472,000 and 450,000, valued at \$13,310,000 and \$12,870,000; sheep numbered 734,000 and 720,000, valued at \$3,597,000 and \$3,240,000; swine numbered 1,023,000 and 956,000, valued at \$7,161,000 and \$7,552,000. The production of wool in 1915 and 1914 was 1,978,000 and 2,063,000 pounds, respectively.

MINERAL PRODUCTION. The total production of iron ore in the State in 1914 was 346,382 long tons, compared with 492,649 long tons in 1913. The marketed value of the product in 1914 was \$719,415, compared with a value of \$983,279 in 1913. The production of coal in the State was 7,959,535 short tons, valued at \$8,032,448. This was 868,533 tons less than in 1913, with a decline in value of \$920,205. In spite of this the output was greater than in any year previous to 1913. The number of men employed in the coal mines in 1914 was 9183. The value of the total mineral production in 1914 was \$16,400,347, compared with \$17,178,580 in 1913.

TRANSPORTATION. The total railway mileage of the State on June 30, 1914, amounted to 7401; of this 3497 was main track. About 185 miles of new track was constructed during the year.

EDUCATION. The total school population in the State in 1914 was 616,168. The enrollment in the public schools was 427,927. The average daily attendance was 281,976. The teachers employed numbered 11,336, of whom 9383 were females, and 1953 were males. The average monthly salary of male teachers was \$60.59, and of females \$40.66.

FINANCE. The report of the auditor of public accounts for the fiscal year ending Sept. 30, 1915, showed a balance on Oct. 1, 1913, of \$482,823. The receipts for the year amounted to \$7,797,532; the disbursements to \$7,645,357, leaving a balance on Oct. 1, 1914, of \$635,417.

CHARITIES AND CORRECTIONS. The charitable and correctional institutions under the control of the State include the Penitentiary at Richmond, State Farm at Lassister Post Office, the State Hospital at Petersburg, the Eastern State Hospital at Williamsburg, Southern Hospital at Marion, Western Hospital at Staunton, Virginia State Epileptic Colony and Virginia Colony for Feeble-minded at Madison Heights, the Catawba Sanatorium at Catawba, the Virginia School for the Deaf and Blind at Staunton, and the Virginia School for the Colored Deaf and Blind at Newport News. In addition there are several institutions supported by the State, but owned and controlled by independent boards. The State Board of Charities and Corrections has control of the jails and alms houses.

STATE GOVERNMENT. Governor, Henry C. Stuart; Lieutenant-Governor, J. T. Ellyson; Secretary of Commonwealth, B. O. James; Auditor, C. Lee Moore; Treasurer, A. W. Harman, Jr.; Superintendent of Instruction, R. C. Stearnes; Attorney-General, J. Garland Pollard; Adjutant-General, W. W. Sale; Commissioner of Agriculture, George W. Koiner; Commissioner of Insurance, Joseph Button—all Democrats.

JUDICIARY. Supreme Court of Appeals: Chief Justice, James Keith; Justices, S. G. Whittle,

Joseph L. Kelly, George M. Harrison, and Richard H. Cardwell; Clerk, H. Stewart Jones.

STATE LEGISLATURE:

	<i>Senate</i>	<i>House</i>	<i>Joint Ballot</i>
Democrats	86	88	124
Republicans	4	12	16
Democratic majority..	82	76	108

VIRGINIA, UNIVERSITY OF. A State institution for higher education, founded in 1818 at Charlottesville, Va. The total enrollment in all departments in the autumn of 1915 was 1014. There were 100 members in the faculty, including professors, instructors, and assistants. There were no notable changes in the faculty during the year. Bequests and donations amounting to \$286,790 were received. The endowment funds at the end of the fiscal year amounted to \$2,211,472, and the total income to \$344,315. The library contained about 100,000 volumes. The president was E. A. Alderman, D.C.L., L.L.D.

VIRGIN ISLANDS. A presidency of the Leeward Islands colony. Tortola is the largest island (there are about 32); Road Town (in Tortola), the chief town, had in 1911, 410 inhabitants. Cotton, sugar-cane, and limes are grown.

	1907-8	1909-10	1910-11	1913-14
Imports	£ 7,009	£ 7,579	£ 8,717	£ 8,897
Exports	5,951	7,519	6,684	7,801
Revenue	2,885	2,371	6,091	7,885
Expenditure ..	2,050	2,384	5,964	6,086
Shipping * ..	18,796	12,858	12,770	18,195

* Tonnage entered and cleared.

VITAL STATISTICS. The decrease in the birth rate throughout the Western world has been noticeable for years. In Great Britain it was 22.9 per thousand during the last year, a decrease of 3.3 below the mean rate for 10 preceding years. At the same time the death rate shows an increase, being 14.9 per thousand, 1.2 above the mean for the last decade. A compilation of the birth and death rates in several foreign countries yields the following statistics. In 1913 the birth rate per thousand population was as follows: Russia, 43.9; Bulgaria, 42.0; Rumania, 39.2; Serbia, 38.5; Austria, 32.6; Hungary, 35.7; Italy, 33.3; Spain, 33.1; Portugal, 32.3; Germany, 29.8; Holland, 28.6; Denmark, 27.5; Norway, 26.1; Sweden, 24.7; Great Britain, 25.0; Switzerland, 25.0; Belgium, 23.6; France, 19.6. Hand in hand with the decrease in birth rate, however, the death rate similarly decreased from East to West. The death rate per thousand population in 1913 was: Italy, 28.9; Rumania, 24.8; Bulgaria, 23.5; Serbia, 22.1; Hungary, 23.1; Spain, 23.3; Austria, 23.0; Portugal, 19.8; France, 17.8; Germany, 16.2; Belgium, 15.2; Switzerland, 15.1; Great Britain, 14.0; Sweden, 14.0; Holland, 13.6; Denmark, 12.9. From the comparison of these two series of numbers, the following conclusion can be drawn. The increase of population in 1913 per thousand population has been: Bulgaria, 18.5; Serbia, 16.4; Holland, 15.0; Russia, 15.0; Denmark, 14.6; Rumania, 14.4; Germany, 15.6; Italy, 13.4; Portugal, 12.7; Norway, 12.6; Hungary, 12.1; Austria, 11.3; Great Britain, 11.0; Sweden, 10.7; Switzerland, 7.9; Spain, 9.8; Belgium, 8.6; France, 1.8.

During the war period, of course, the birth

rate has sensibly diminished. The year 1914 closed in Berlin with a birth record which was 3500 less than in 1913. The excess of births over deaths was 5100 less. Parkes of Great Britain estimates the total destruction of life in Europe in the two years of war as nearly 20,000,000 persons. The factors causing unfavorable conditions for the birth rate after the war are an increase in the excess of females, and the survival of the weaker men, physically and mentally. History shows that after war the birth rate declines, but rises again in the following years, above the position it occupied before. A victorious war is followed by an economic advance, during which also fertility is increased.

In New York State the infant mortality has dropped from 137 to 112 births per thousand, which denotes an actual saving of over 1400 lives annually, and which followed an educational campaign of a year, costing \$14,500. New York City's death rate was 14 per 1000. The mortality of children of alien parents is lower than that of the native population. This is explained by the statement that foreign mothers stay at home more, and are more with their children, and that health authorities come into more frequent and personal contact with the foreign mothers. According to a recent bulletin issued by the Census Bureau, the total number of deaths in the 25 States comprised within the registration area, for 1914, was 898,059, corresponding to a death rate of 13.6 per thousand, which is 16 per cent less than the average for the decade between 1901 and 1905. Rhode Island, New York, New Jersey, Massachusetts, Vermont, Connecticut, Indiana, Maine, and New Hampshire showed decreases, while Michigan showed a slight increase in the death rate. In cities of 100,000 or over the tendency is still to show a decrease, notably Jersey City, New York, San Francisco, Denver, Newark, N. J., Los Angeles, Pittsburgh, Atlanta, Ga., Lowell, Mass., and Paterson, N. J. But from these figures the relative health advantages of different States cannot be inferred without further investigation. Nearly 18 per cent of all deaths were of infants under 1 year, and more than 25 per cent were among children under 5 years. After 5 years the highest rates obtained between the ages of 70 and 74 for both sexes, a little higher for women alone. The death rate for tuberculosis declined from 149.5 per thousand in 1912 to 147.6 in 1913. The rates for typhoid fever, scarlet fever, diphtheria, croup, pneumonia (all forms), diarrhoea, and enteritis have shown a general decline since 1900; while there has been an almost continuous increase from year to year since 1900 in the death rates from cancer, organic heart diseases, endocarditis, and nephritis. The rate for cancer rose from 63 per hundred thousand in 1900 to 78.9 in 1913. Similar alarming increase of the death rate from cancer is noted in Great Britain. See also STATISTICAL ASSOCIATION, AMERICAN.

The following statistics as to contagious diseases throughout the world are compiled from the United States Public Health Reports. While in many instances incomplete and misleading, they are the best obtainable.

SMALLPOX. Arabia, 57 cases, 53 deaths; Argentina, 1 death; Australia, 470 cases, 3 deaths; Austria-Hungary, 1436 cases, 250 deaths; Belgium, 8039 cases, 14 deaths; Brazil, 1114 cases, 414 deaths; British South Africa, 3 cases, 1

death; British Honduras, 1 case; Bulgaria, 121 cases; Canada, 199 cases, 7 deaths; Canary Islands, 3 deaths; Ceylon, 459 cases, 125 deaths; China, 112 cases, 164 deaths; Cuba, 8 cases, 2 deaths; Dutch East Indies, 3205 cases, 825 deaths; Egypt, 243 cases, 70 deaths; France, "present"; Germany, 93 cases, 2 deaths; Great Britain, 72 cases, 10 deaths; Greece, 98 cases, 83 deaths; Guadalupe, "present"; India, 1346 cases, 1164 deaths; Indo-China, 163 cases, 33 deaths; Italy, 9 cases; Japan, 147 cases, 45 deaths; Martinique, 5 cases; Mexico, 978 cases, 477 deaths; Netherlands, 5 cases, 1 death; Newfoundland, 1 case; Norway, 8 cases, 2 deaths; Persia, "present"; Peru, "epidemic"; Philippine Islands, 2 cases; Porto Rico, 3 cases, 1 death; Portugal, 83 cases; Russia, 2220 cases, 583 deaths; Serbia, 356 cases; Santo Domingo, 2 deaths; Siam, 1 death; Spain, 1446 cases, 253 deaths; Straits Settlements, 29 cases, 11 deaths; Sweden, 1 case, 1 death; Switzerland, 162 cases; Turkey in Asia, 423 cases, 127 deaths; Union of South Africa, 4 cases; Venezuela, "present"; Zanzibar, 7 deaths; at sea, 1 case, 1 death.

PLAGUE. Argentina, 1 case; Azores, "present"; Bahrein, 20 cases, 9 deaths; Brazil, 46 deaths; Ceylon, 139 cases, 122 deaths; China, 99 cases, 85 deaths (increasing 40 deaths daily estimated); Cuba, 21 cases, 9 deaths; Dutch East Indies, 7917 cases, 6260 deaths; Ecuador, 382 cases, 157 deaths; Egypt, 170 cases, 62 deaths; Greece, 20 cases, 20 deaths; Hawaii, 4 cases, 3 deaths; India, 427,381 cases, 347,821 deaths (Jan. 1 to Oct. 30, 1915); Indo-China, 501 cases, 385 deaths; Japan, 473 cases, 399 deaths; Mauritius, 90 cases; Persia, 86 cases, 82 deaths; Peru, 557 cases, 190 deaths; Russia, 9 cases, 2 deaths; Senegal, "present"; Siam, 22 deaths; Straits Settlements, 34 cases, 24 deaths; Turkey in Asia, 1456 cases, 1064 deaths; Union of South Africa, 39 cases, 22 deaths; Zanzibar, 4 deaths.

CHOLERA. Austria-Hungary, 2325 cases, 640 deaths; Borneo, 71 deaths; Ceylon, 9 cases, 2 deaths; China, "present," 10 cases, 9 deaths; Dutch East Indies, 1639 cases, 1395 deaths; Germany, 1293 cases, 231 deaths; India, 1642 deaths; Indo-China, 3461 cases, 1869 deaths; Italy, 4 cases; Japan, 11 cases, 1 death; Philippine Islands, 104 cases, 60 deaths; Persia, 175 cases, 10 deaths; Russia, 317 cases, 114 deaths; Serbia, 2 cases; Siam, 24 deaths; Straits Settlements, 169 cases, 118 deaths.

YELLOW FEVER. Brazil, 6 cases, 3 deaths; Canal Zone, 4 cases; Ecuador, 6 cases, 4 deaths; French Guiana, 15 cases, 8 deaths; Mexico, 4 cases, 2 deaths; Venezuela, 1 case.

TYPHUS FEVER. Austria-Hungary, 11,594 cases, 12 deaths; Azores, "present," 1 case; Bermuda, 1 case; Canada, 1 case, 1 death; Canary Islands, 4 deaths; China, 15 cases, 3 deaths; Cuba, 2 cases, 2 deaths; Curacao, 4 cases, 1 death; Dominican Republic, 2 deaths; Dutch East Indies, 423 cases, 64 deaths; Egypt, 741 cases, 586 deaths; France, 1 case, 1 death; Germany, 564 cases, 11 deaths; Great Britain, 41 cases, 4 deaths; Greece, 283 deaths; Guatemala, "present"; Italy, 68 cases, 20 deaths; Jamaica, 1 case; Japan, 62 cases, 3 deaths; Mexico, 16 deaths; Netherlands, 1 case; Russia, 2307 cases, 201 deaths; Serbia, "epidemic" (500 daily); Spain, 13 deaths; Sweden, 5 cases; Switzerland, 8 cases; Turkey in Asia, 72 cases, 30 deaths.

VIVISECTION. A partial enumeration of

the benefits of animal experimentation appeared in an address by Landis, health officer of Cincinnati. He showed that the objects sought are simply the prevention of suffering, disease, and death, and the prolongation of life of man and of animals. The lower animals have been so far benefited that many diseases which formerly levied a tremendous toll of animal lives, are now under control or stamped out in large areas. Anthrax, which killed millions of stock a few years ago; pleuropneumonia (entirely eliminated in this country at a cost of \$1,500,000), which caused in England alone a loss of \$450,000,000 during the first quarter of the nineteenth century, and threatened to ruin the cattle industry in the United States; glanders formerly causing thousands of deaths; Texas fever which destroyed thousands of cattle; hog cholera and bovine tuberculosis—all these diseases are now understood and their prevention is being increasingly brought about, and largely through animal experimentation. Turning to the consideration of human beings, diphtheria in Cincinnati, for example, was so controlled by the use of antitoxin, that the mortality fell from 71 to 12 per cent. Had the deaths from this disease kept pace with the population as in the days before Behring's discovery was utilized, 56,345 children would have died in that city alone from diphtheria, who were saved through the knowledge gained by animal experimentation. The prevention of lockjaw and of hydrophobia is due to results obtained from similar experiments, and likewise the control of cholera, the plague, smallpox, malaria, yellow fever, and epidemic cerebro-spinal meningitis. Many rats were sacrificed to learn how to control the plague, as well as a vast number of perfectly innocent mosquitoes in the investigation of malaria. In his brilliant and successful work which terminated in the devising of the successful serum for meningitis, Flexner used 25 monkeys and 100 guinea pigs. Childbed fever, in the olden time, claimed as many as 75 per cent of the inmates of maternity hospitals. Through the results of the animal experimentation of Lister and Pasteur, the mortality now is 1 per cent. Landis sums up thus: "All advances in therapy, whether due to specific serums, vaccines, antitoxins, or drugs, are the direct results of experiment on man or animals."

VOCATIONAL EDUCATION. See EDUCATION IN THE UNITED STATES.

VOCATIONAL TRAINING, FEDERAL AID FOR. See EDUCATION IN THE UNITED STATES, section so entitled.

VODKA. See RUSSIA.

VOISINS-SEGALEN-LARTIGUE EXPEDITION. See EXPLORATION, Asia.

VOLCANISM. See GEOLOGY.

VOLCANOES. The continued manifestations of activity by Lassen Peak, which suddenly broke out in eruption on May 30, 1914, attracted much attention during the early part of the year 1915, when they assumed a rather violent phase. No lava was ejected, but large amounts of ash and clouds of vapor gave a formidable aspect to the rejuvenated volcano which long had been thought to be extinct. On May 19, 1915, a river of mud poured from the north side of the crater down the mountain and into Hat Creek; it inflicted much damage to the ranches in the vicinity and to the government forests. After this the conditions became more

tranquil, and it appeared that the volcano had spent its force. An eruption in the volcanic belt of the Alaskan Peninsula was brought to light by reports from the ship *Patterson* of the United States Coast and Geodetic Survey; loud detonations and the fall of ash were observed on July 6, 1914, while the ship was in the vicinity of Korovin Island. The source of the disturbance was thought to be Pavlof volcano, about 50 miles away, which later was proved to be the case. Spasmodic activity has been manifest in this section for some time. See GEOLOGY.

VOLUNTEERS OF AMERICA, THE. A Christian and social organization modeled on the United States army, and incorporated in 1896 under the laws of the State of New York. Although ruled by military discipline and methods, it is democratic in its constitution, which was framed by a Grand Field Council which consists of representatives of minor and local councils of officers elected annually. The Volunteers in 1915 had 48 homes and charitable institutions in the leading cities and towns of the United States. During 1915 the Volunteer workers visited and aided 28,362 families, and in their charitable institutions 241,297 free lodgings were given. Lodgings were paid for by work found for 247,855 persons; free meals were given to 875,000 persons, and 303,200 meals were given to persons who paid for them either by money or work. The Volunteer Prisoners' League had enrolled in 1915 upwards of 81,000 members, had organized leagues in 28 State prisons, and by means of its Hope Halls had enabled more than 70 per cent of the discharged prisoners to lead better lives. During 1915, 783,279 persons attended indoor meetings, and 1,895,686 persons attended open-air meetings. Nearly 5500 persons were converted at the services. At the Volunteer Hospital in New York City there have been 2212 ambulance calls, 11,713 days' treatment of patients in the surgical and medical wards, 9435 new cases treated, and 14,298 old cases treated. Large quantities of Christian literature have been sent to the State prisons, jails, hospitals, soldiers' homes, and children's homes. The Volunteers have also organized different departments for sewing classes, financial relief, fresh air resorts, hospital nursing, etc. The headquarters are at 34 West Twenty-eighth Street, New York City. The officers are: Gen. and Mrs. Ballington Booth, presidents; Gen. Edward Fielding, vice-president; Col. Walter J. Crafts, treasurer; and Col. James W. Merrill, national secretary.

VON PAPEN, CAPTAIN FRANZ. See UNITED STATES AND THE WAR.

VORARLBERG. See AUSTRIA-HUNGARY.

VOTING, PREFERENTIAL. See MUNICIPAL GOVERNMENT, *Proportional Voting*.

WAGES. See LABOR; LABOR LEGISLATION; MINIMUM WAGE.

WALDTEUFEL, EMILE CHARLES. A French composer, died Feb. 17, 1915. He was born in Alsace in 1837, and at the Conservatory in Paris he studied composition and the piano. Although successful as a pianist and appointed pianist to the Empress Eugénie, he was chiefly known as a composer of dance music. His numerous compositions for a time rivaled the popularity of those of Johann Strauss. His waltzes were played by orchestras throughout the world.

WALES. See GREAT BRITAIN.

WALSH, BLANCHE (Mrs. W. M. Travers). American actress, died Oct. 31, 1915. She was born in New York City in 1873, and was educated in the public schools and in the New York Normal College. She made her first appearance on the stage in Chicago in September, 1888, as "Queen Elizabeth" in *Amy Robsart*. In the same year she appeared in the Fifth Avenue Theatre as "Olivia" in *Twelfth Night*. Her success was pronounced from the beginning of her career, and she appeared in many plays, among them *Aristocracy*, *Trilby*, *Secret Service*, *The Great Diamond Robbery*, and *The Conquerors*. She was seen first in London in 1897, in *Secret Service*. In 1900 she married William M. Travers.

WALTON, WILLIAM. American artist, died Nov. 23, 1915. He was born in Philadelphia in 1843, and was educated in the public schools. He studied painting at the Pennsylvania Academy of the Fine Arts, at the National Academy of Design, New York, and under Carolus Duran at Paris. His reputation was gained chiefly as a painter of figures and landscapes. He wrote much on subjects connected with art.

WAR BOOKS. See LITERATURE; PHILOSOPHY; and works noted in WAR OF THE NATIONS.

WAR BREED. See FOOD AND NUTRITION.

WARD, EDGAR MELVILLE. American artist, died May 15, 1915. He was born in 1838 at Urbana, Ohio, and graduated from Miami University in 1858. He spent the next eight years in Paris in the study of art, receiving there a medal for the "Sabot Maker," which was exhibited at the Paris Salon, and was later acquired by the French government. Among the works which gained him fame before he returned to the United States were "Paternal Pride," "Blessing," and "Brittany Washer-women." In 1887 he was elected a member of the National Academy of Design, and professor of drawing and painting in the academy school. Some of his best known works are "The Coppersmith," "The Block Maker," "The Last Sheaf," and the "Quilting Party."

WARE, WILLIAM ROBERT. American architect and educator, died June 9, 1915. He was born in Cambridge, Mass., in 1832, and graduated from Harvard in 1852. From 1860-81 he practiced architecture in Boston, and from 1865-81 was professor of architecture at the Massachusetts Institute of Technology. In the latter year he was appointed to the same chair in Columbia University, and held this position until 1903, when he became professor emeritus. He was a Fellow of the American Academy of Arts and Sciences, and an honorary corresponding member of the Royal Institute of British Architects. He was the author of, notably, two books—*Modern Perspective* (1882) and the *American Vignola* (1903).

WAR LOANS. See FINANCIAL REVIEW, *Foreign Credits*.

WARNER, ANNA BARTLETT. An American writer, died Jan. 22, 1915. She was born in New York City in 1828, and at an early age began writing under the pen name of "Amy Lothrop." She was a sister of the late Susan Warner, who was also well known under the pen name of "Elizabeth Wetherell." She wrote many novels and stories for children, and a biography of her sister. Miss Warner was the owner of the Gilbert Stuart painting of Washington, and bequeathed the portrait to the corps



critical standpoint, the success of the German military machine in conquering Belgium, Poland, and Serbia, and the development of a frankly annexationist sentiment in Germany (see *GERMANY, Debate on Peace Terms*) rendered the German megalomania more than ever menacing to the free nations of Europe—and America, according to the belief of the more excitable prophets of disaster. The spokesman of the Teutonic powers likewise evinced a tendency to forget the particular incidents which precipitated the struggle, and to regard the war as the culmination of British commercial jealousy, of French revenge for 1871, of Russian Pan-Slavic aspirations, of Italian perfidy. Both Germans and Allies delighted to picture their antagonists as savages devoid of ordinary humanity. The Germans accused the Belgians of the most revolting crimes against civilians as well as of "sniping" German soldiers; the Serbs had committed similar outrages against Austrian troops; the English had used "dum dum" bullets; the Russians had massacred Polish Jews. Similarly the Allies published impressive official investigations of German "atrocities" in Belgium and France, of Austrian crimes in Serbia, and of Turkish atrocities in Armenia. The Germans reproached the British for endeavoring to "starve" innocent women and children in Germany; the British characterized German Zeppelin raids and the sinking of the *Lusitania* as wanton murder. The Germans taunted their antagonists with reliance upon black and yellow soldiers—men of "inferior" races—and upon British "mercenaries." The Allies reproached the Teutons for dragging in the infidel Turk and the Bulgars stained with the wanton blood of the Balkan War. The effect of such recriminations was to fortify the impression that the war was a war in defense of civilization, each side representing itself as the defender. Meanwhile expressions of opinion in influential circles in the belligerent countries began to afford a more precise indication of the concrete interests at stake. Belgium was fighting for independence and indemnity; Serbia, for Greater Serbia, including the Austro-Hungarian provinces of Bosnia, the Herzegovina, and possibly Dalmatia, the Banat, and Croatia. France was determined to reconquer Alsace-Lorraine. British patriots were divided, some demanding the "complete destruction of German militarism," others contenting themselves with the restoration of Serbia and Belgium to independence, Alsace-Lorraine to France, in addition to indemnities, the maintenance of British naval supremacy, and possibly the annexation of some German colonies. British commercial organs gave the war a more predominantly economic character, and urged British business men to "capture German trade." Members of the Russian government officially expressed the hope that the Austrian and Prussian parts of Poland would be reunited with Russian Poland under the Russian sceptre, and that Russia would gain freer access to the open sea to the southward, presumably by the conquest of Constantinople; under Russian control, the ancient citadel of Eastern Christendom would again become the recognized capital of the Orthodox Christian nations of eastern Europe. The Italian government went into the war purely and simply for territorial aggrandizement: for the Italian-speaking districts of Trent and the Aus-

trian seaport of Trieste (inhabited by Italians), for a foothold in Albania, ensuring command of the Adriatic, and possibly for privileges in Asia Minor. On the other side, Enver Pasha and his "Young Turk" associates were persuaded that Turkey, in alliance with German capital and with the aid of German industrial and military efficiency, was on the eve of a wonderful rejuvenation; at the very least, Persia and Egypt would be emancipated and incorporated in the Ottoman Empire. Bulgaria was obviously determined to conquer Macedonia, to win a seaport at Saloniki, and to regain the ancient Bulgar capital of Ochrida. For the Dual Monarchy, the war was a desperate battle against the Pan-Slavic movement which threatened to sunder Galicia, Croatia, Bosnia-Herzegovina, and other Slavic provinces from the Hapsburg Empire; if successful, the war would place a temporary restraint upon Russian Pan-Slavism, permanently abolish Pan-Serbianism, and secure Austro-German-Bulgar supremacy in the Balkans. Lastly, for Germany, the war was popularly conceived as defensive, but the ruling classes hinted, and the mass of the population appeared to be persuaded, that not only must Germany prevent Russia from annexing East Prussia and Posen, France from regaining Alsace-Lorraine, and Great Britain from "capturing German trade," but in addition Germany must fight to obtain "guarantees" for her future safety and prosperity; stronger strategic frontiers must be acquired by annexing a strip of French territory from Verdun to Belfort and a part of Western Russia; the Baltic provinces of Russia must be "recovered"; Poland must be reconstituted under German influence as a buffer state against Russia; Great Britain must be compelled to respect the "freedom of the seas"; and Germany's economic development must be ensured by obtaining commercial access to Antwerp, by strengthening the Turco-Teutonic Empire in the Near East, and by restoring, if not enlarging, the German colonial possessions. Only the most extreme imperialists favored the annexation of all Franco-Belgian territory now in German possession; more temperate patriots looked for the barter of Belgium and northern France for colonial territory.

III. DIPLOMACY OF THE WAR

Whereas, at the outbreak of the great war German diplomacy, with its blustering ultimatums and its clumsy explanations, failed to enlist the sympathies either of Italy, Germany's ally, or of neutral nations outside of Europe, during the year 1915 German diplomacy regained much of its lost prestige. The negotiations by which, on the one hand, Turkey was persuaded to cede the Dedegatch Railway to Bulgaria (see *BULGARIA*), and, on the other hand, the possible conflicts were obviated between Austria-Hungary's Balkan ambitions and Bulgaria's Macedonian claims, to the end that Bulgaria might join in a quadruple alliance with Turkey, Austria-Hungary, and Germany, were not made public as yet, but their result, the joint invasion of Serbia and the opening up of the road from Berlin to Constantinople, was on its face a notable triumph for Teutonic diplomacy. Moreover, Rumania was kept neutral by well-calculated promises, if the Bulgarian premier's statement may be credited; King Con-



KING PETER OF SERBIA



KING FERDINAND OF BULGARIA



KING CONSTANTINE OF GREECE



KING FERDINAND OF RUMANIA

FOUR RULERS OF BALKAN STATES

stantine of Greece was strengthened in his obstinate refusal to allow the Venizelist parliamentary majority to make war on Turkey; Prince von Buelow delayed the entry of Italy into the war during the spring, when the Central Powers needed all their troops on the Russian and Franco-Belgian fronts. In justifying Germany's submarine policy to neutral nations, and notably to the United States, the German diplomatists were less successful, but at any rate they avoided open rupture, without sacrificing submarine warfare. The diplomacy of the Entente Powers, on the other hand, suffered two serious reverses. First, Italy could not be induced to throw in her lot with the Allies until many months had been wasted in parley. Second, by pursuing a mistaken policy in the Balkans, the Entente not only failed to achieve its object—the reconstitution of the Balkan alliance against Turkey—but also estranged Rumania and Greece, so that instead of entering the war in January, 1915, as had been expected, they remained neutral throughout the year. Over against these failures may be set one great accomplishment, the inclusion of Italy and Japan in the Pact of London. The Pact of London, it will be recalled, was the agreement signed in London by representatives of Great Britain, France, and Russia, Sept. 5, 1914, binding their respective nations not to make peace except in concert with the others. Japan was included in the agreement on Oct. 19, 1915. Italy's adhesion was announced by Baron Sonnino to the Italian Parliament, Dec. 1, 1915. As far as pledges could bind, the Pact of London would be a bulwark of the solidarity of the Coalition against the Quadruple Alliance, and would make it impossible for Germany to force her antagonists separately to surrender upon humiliating terms. For further details regarding the entry of Italy into the war, consult the paragraph on that subject in this article, and the separate article on ITALY; for details regarding the Balkan situation, see *The Diplomatic Failure in the Balkans* (*infra*) and the separate articles on ALBANIA; BULGARIA; FRANCE; GREAT BRITAIN; GREECE; RUMANIA; SERBIA; TURKEY.

IV. THE SITUATION ON JAN. 1, 1915

The course of the war in 1915 may be made intelligible only after the essential elements in the situation at the beginning of the year have been clearly grasped. The battles of 1914, it must first of all be remembered, were significant principally because they exposed two momentous fallacies. The belief that before the terrific onslaught of the German army, with its unrivaled discipline and its ponderous howitzers, the resistance of France would wither and crumple up, was definitely relegated to the realm of fancy by the battle of the Marne (Sept. 6-10, 1914); the magnificent holding battle fought by the French, after a long and a discouraging retreat, effectively dispelled the illusion that the swift Prussian victory over France in 1871 could be repeated in 1914. By the close of the year, therefore, a sudden decisive German victory in the West was no longer hoped for—or feared. The second fallacy was the popular Anglo-French confidence in the hugeness of Russia. In the autumn of 1914, military critics in Allied countries had cheerfully predicted that if the Anglo-

Franco-Belgian line could be held intact for a few months longer, the Russian "hordes" would overwhelm Germany from the East, like an enormous military "steam-roller" or an irresistible "tidal wave." After five months of the war, neither "steam-roller" nor "tidal wave" had materialized; the Russian invasion of Galicia was offset by the Teutonic invasion of Poland; several disastrous defeats had overtaken Russian armies; and it was already becoming apparent that without adequate railway facilities, without proper training and equipment, and without sufficient ammunition, the "Russian hordes" could not seriously menace Germany. In short, by the close of the year 1914 it had become reasonably clear that neither the efficiency of the Germans nor the numbers of the Russians would suffice to achieve an immediate victory. In 1915, consequently, the war revealed itself as a contest of endurance, in which mere battles might play a far less decisive rôle than political and economic factors. Regarding the situation in this light, the principal factors upon which the Allies might count may be summarized briefly as follows: (1) The immense naval superiority of the British and Allied fleets would enable the Allies to make full use of their commercial and colonial resources, to draw upon neutral nations for munitions and food, to transport troops freely from the remotest regions of Australasia to European battlefields, and possibly to "starve Germany out" by destroying her commerce and cutting off her food-imports; (2) the Allies expected that "Kitchener's army," several millions strong, amply supplied with munitions from English factories, would make possible a great offensive movement against the German lines in Belgium and France; (3) Italy's entry into the war seemed comparatively certain; (4) negotiations were under way, in January, for the reconstitution of the Balkan alliance of Bulgaria, Greece, Serbia, and Rumania, for a new war against Turkey; (5) the attitude of a few Socialists in Germany (see GERMANY) and the publication of reports regarding popular unrest in Austria-Hungary (see AUSTRIA-HUNGARY) led Allied journals to predict an uprising of the masses against the ruling military aristocracy in the Central Powers. On the other hand, the Germans might hope: (1) That economy, industrial efficiency, and submarines might compensate Germany for the loss of her overseas trade; (2) that the superior training and equipment of the German and Austro-Hungarian troops might more than counterbalance any numerical superiority which the Allies might achieve; (3) that by skillful diplomacy Italy might be persuaded to remain neutral, or at least to delay a declaration of war until the Central Powers had further strengthened their position; (4) that Bulgaria and possibly Rumania would espouse the Turco-Teutonic cause, out of self-interest; (5) that the discontented millions in Egypt and in India, as well as the disgruntled Irish Nationalists and the pacifist labor organizations in England, might cripple the British Empire in the war; (6) that the amazing inefficiency already revealed in certain branches of the Allies' organization, the absence of unity in the Allies' political and military programmes, and the apparent inability of the British and Russian governments to command the confidence of the people, might lend inval-

uable assistance to the Central Powers; (7) and, finally, that the superior strategic situation of the Teutonic Powers, with their ability to transfer troops quickly from point to point on the battle-line, thanks to a wonderful system of railway communications, would contribute to the ultimate achievement of victory.

V. MILITARY OPERATIONS

(1) *The Allied Offensive in France: January-April.*

The first great German offensive in the West had been repulsed at the battle of the Marne (Sept. 6-10, 1914); the second serious German offensive in the West, the "drive to Calais," had been stopped in October and November by the valiant resistance of the Belgians on the Yser, the British colonials and French troops before Ypres, and the Anglo-French line in Artois. By the beginning of January, 1915, the 600-mile battle line in Belgium and France, extending from the coast of the Channel to the border of Switzerland, had become almost stationary, and was so formidably intrenched and fortified that it could not possibly be broken except at a terrible cost of life and with an enormous expenditure of shells. Notwithstanding the difficulty, the Allies confidently planned to undertake a general offensive movement during the spring

Champagne country, northeast of Reims, through Perthes across the forested ridge of Argonne to the Meuse River, just west and north of Verdun; (c) the eastern sector, swinging around the great fortifications of Verdun, bending back sharply to the Meuse again at St. Mihiel (about 10 miles south of Verdun), turning east again from St. Mihiel to strike the Moselle River at a point near the Lorraine frontier, extending southeast along the Lorraine border, and crossing over the crest of the Vosges into Upper Alsace, where Thann was still retained by the French. It will be observed that the Belgians held only 18 miles and the British only 31 miles of the front, while the French army, about two and a half millions strong, defended the remaining 543 miles.

(a) The fighting on the northern sector, from January 1st to April 21st, effected little change in the line. On the extreme north, the Allies captured a sand dune of some strategic importance just east of Nieuport, January 28th, repelled German attacks at Ypres and west of La Bassée, January 25th-February 5th, and captured a brickfield east of Cuinchy, February 6th. The first ambitious offensive in this sector was undertaken on March 10th by the British, who by this time numbered well-nigh 500,000 men. Early in the morning a terrific bombardment of the German trenches west of Neuve Chapelle (about two-thirds the distance from Arras to Armentières) and of the village itself prepared the way for an infantry attack. Before noon the village of Neuve Chapelle, now a smoldering heap of ruins, was completely in British possession. The attacking forces north of the village, where the artillery preparation had not been so effective in demolishing the German defenses, were caught in barbed wire entanglements and cruelly decimated by German machine-gun fire; but in spite of losses the attack succeeded. On the afternoon of March 10th, however, and on the two succeeding days, the British failed to push their advantage with energy; the Germans were allowed to recover from the surprise and demoralization of the sudden bombardment; the British artillery was poorly aimed during the cloudy weather of the second and third days' fighting, and as a result of the destruction of telephonic communications orders were imperfectly obeyed. Consequently the British failed to gain the commanding ridge east of Neuve Chapelle. At the cost of 13,000 men Sir John French had advanced his line a mile or so, on a front of three miles. Three days after the British offensive had come to a standstill, the British minister of war, Lord Kitchener, told the House of Lords that the supply of war munitions was causing him "very serious anxiety." Sir John French's dispatch describing the battle of Neuve Chapelle, published on April 14th, likewise referred to the pressing need of "an almost unlimited supply of ammunition." Hence it may be concluded that one very potent factor in the British failure to make Neuve Chapelle a great victory was the lack of artillery support after the initial bombardment. This first move in the Allied offensive on the northern sector met with ill success; Lille had been its final objective, and Lille had not even been seriously menaced. For over a month no important action was fought on the northern sector, until the capture of a hill near Ypres (Hill 60) by the British, April



ALLIES' LINE, JANUARY, 1915

months of 1915. The progress made up to the fourth week of April, when the Allied offensive was interrupted by a German counter-attack at Ypres, will be more easily evaluated if the Allied front is considered as three sectors: (a) the northern sector, extending in a line over a hundred miles long from the Belgian town of Nieuport east of Ypres and Armentières, west of Lille, east of Arras, west of Péronne, east of Roye, and through Noyon to a point on the Oise River a few miles north of Compiègne, and held by Belgian and French troops from Nieuport to Ypres, by British from Ypres to Bethune, and by French alone from Bethune to the Oise; (b) the central sector, exclusively French, from the Oise to Soissons on the Aisne, following the northern bank of the Aisne for perhaps twenty miles, then swinging southeast through the



A TYPICAL TRENCH SCENE IN THE CHAMPAGNE DISTRICT



Photographs by Paul Thompson

**AN ANGLO-INDIAN SOLDIER IN A FRENCH TRENCH USING ANTI-AIRCRAFT GUN
THE WAR IN EUROPE**

17th, precipitated a violent German counter-attack.

(b) Meanwhile in the central sector a lucky French attack had won Hill 132 north of Soissons, January 8th, but General von Kluck had quickly returned the attack with two German army corps, and not only had forced the French back to their old position across the Aisne River, but for a time had seriously threatened to capture Soissons. Further east, in Champagne, the French during the month of January captured Perthes and a near-by hill of some strategic importance; the attack was renewed in February with strong artillery support; but only painfully slow progress was made towards the east-and-west railway which General Joffre hoped to cut. On the Argonne ridge the French aimed chiefly to cut the railway to Apremont, but the fighting was indecisive.

(c) On the eastern sector, on the extreme right wing, the French Alpine Chasseurs descended from the Vosges heights into the Thur Valley and captured the Alsatian town of Steinbach, January 3rd. Other French forces menaced Muelhausen. The Germans, however, retaliated by expelling the French from their advantageous position on a shoulder of Hartmannsweilerkopf, January 19th. In the last week of March the French regained a foothold on Hartmannsweilerkopf, and throughout April and May the mountain was alternately claimed by French and by Germans. The fighting on the snow-clad slopes of the Vosges was picturesque; but the really important efforts of the French in the eastern sector were directed against the wedge which the Crown Prince had thrust into the French line at St. Mihiel, not far south of Verdun. As there was no possibility of breaking the strong apex of the wedge by frontal attacks on St. Mihiel and Camp des Romains, the French endeavored to press the sides of the wedge together, with the hope that if the wedge could be considerably compressed, the German forces at the apex, finding their communications imperiled, would be compelled to withdraw from St. Mihiel. The French position at Verdun would thereby be immensely strengthened. In February, therefore, the French began their attack by capturing the village of Les Eparges on the northern side and the Bois le Prêtre on the southern side of the wedge. On April 5th the attack was resumed against the strongly fortified German position on the heights behind Les Eparges. During four days attack and counter-attack left the result in doubt, but finally the French victory was assured, February 9th, and the heights of Les Eparges remained in French possession. About the same time, General Dubail brought heavy pressure to bear against the southern side of the wedge. Small advances were made, but the main object, to destroy the wedge, was not achieved.

To sum up, by the middle of April the Allied offensive in the West had made small local gains "nibbling" at the German lines, but had failed to accomplish any strategically important object, either in the movement toward Lille, in the advance against the Champagne railway, or in the attack on the St. Mihiel salient. In the fourth week of April "the war of attrition" in the West, that is, the gradual "nibbling" at the German lines and the gradual depletion of the German forces, was suddenly interrupted by a spectacular German counter-offensive at Ypres,

which developed shortly after the capture of Hill 60, near Ypres, by the British. The battle of Ypres will be described in a subsequent paragraph; for the present the situation in the Russian theatre of war commands attention.

(2) *Winter Campaigns in Poland and East Prussia: January-February.*

At the beginning of the year the Russian armies were strung out in a battle line almost 900 miles long. The centre of the Russian line, under General Ruzsky, was strongly entrenched in Russian Poland, behind the Rawka and Bzura rivers, with the strong fortresses of Novo Georgievsk, Warsaw, and Ivangorod along the Vistula River, forming an almost impregnable line of defense upon which the Russians might fall back if hard pressed. The right or northern wing of the Russian army, likewise under Ruzsky's general command, stretched northeastwards to the north of the Narew River, and through the Masurian Lake region of East Prussia, to the Niemen River. The left or southern wing of the Russian army, under General Ivanov, included General Ewart's army on the Nida River, west of Kielce, Gen. Radko Dmitriev's army in Galicia holding Tarnow behind the Donajetz and Biala rivers, General Brussilov's army holding the northern approaches to the Carpathian Mountain passes, General Selivanov's army besieging the isolated Austrian fortress of Przemyśl (on the San), and General Alexeiev's army operating in Bukovina. Opposing the Russian right wing were four German army corps in East Prussia; the Russian centre was confronted by strong German forces under Von Mackensen; on the left wing was General Dankl's depleted army west of the Nida River; south of that, General Woyrsch's army west of the Donajetz; and the extreme Russian left flank in the Carpathians was harried by the Austrian Archduke Eugene from the south. Since their disastrous defeat in East Prussia (see YEAR BOOK for 1914), the Russians had devoted their attention chiefly to General Ivanov's campaign in Galicia, which constituted a three-fold menace: (1) to the invaluable grain-growing plains of Hungary, across the Carpathians; (2) to the important Galician city of Cracow; and (3) to the strategically and industrially important German province of Silesia. The Russian centre meanwhile rested on the defensive in Poland, and the right wing, during January, contented itself with cavalry attacks upon the railway communications north of Tilsit. The Teutonic plan of campaign was to deliver frontal attacks on Ruzsky's army before Warsaw, in order to compel the Russian generalissimo, Grand Duke Nicholas, to reinforce his Polish line at the expense of his Galician forces. The plan had been successfully put into operation in October, 1914, when the Russian armies were approaching Cracow, and it forced the Russians to retire to the San River. It had been tried at the close of November and early in December, to check the renewed Russian advance on Cracow. Again, in the third week of December, 1914, General von Mackensen had furiously assailed the Russian centre just at the time when the Russian campaign in Galicia seemed to be developing favorably. For a fourth time the plan was put into execution in February, 1915, in the hope that a strong German attack in Po-

land would compel the Russians to retire in Galicia and to abandon the siege of Przemyśl. Having prepared the attack by a terrific bombardment of the Russian lines west of Warsaw, General von Mackensen launched his attack, with 140,000 men, on a seven-mile front opposite Bolimov, 40 miles west of Warsaw. On February 1st, under cover of artillery fire, and in the face of a blinding snow-storm, the German infantry masses recklessly rushed the first-line trenches east of the Rawka River. On February 2nd the Russian second- and third-line trenches were taken. On February 3rd and 4th the German troops advanced five miles along the railway towards Warsaw. The attempt to pierce the Russian line seemed to have met with brilliant success, well worth the heavy cost in casualties. Russian reinforcements, hastily rushed to the front by rail from Warsaw, arrived on the spot towards the evening of February 4th, just in time to save the Russian line. Mile by mile the German assailants were forced back over their newly-gained territory, until by February 8th the Germans had been pushed back on the Rawka.

THE GERMAN ATTACK FROM EAST PRUSSIA. While von Mackensen was attacking west of Warsaw, von Hindenburg was preparing a surprise for the Russians in East Prussia. During the first week of February he concentrated nine army corps in East Prussia to hurl against the Russian Tenth Army, which consisted of four army corps under Baron Sievers. On February 7th von Hindenburg delivered the first blow: a German army advancing eastward from Tilsit along the southern bank of the Niemen, thrust itself between the two northernmost Russian army corps. The 20th Russian corps, consisting of 30,000 men under General Bulgakov, which had been holding the line of the Angerap River, was thus exposed to a fatal flank attack from the north. General Bulgakov's retreat speedily became a rout, and the 20th was annihilated in the forest-belt north of Suwalki. The northernmost Russian corps having continued its retreat towards Kovno, General von Eichorn, commanding the extreme right wing of von Hindenburg's line, crossed the Russian frontier and occupied Mariampol, February 12th. Meanwhile von Buelow, directing the German attack on the two remaining Russian corps in the Masurian Lake region, completely cleared East Prussia and pressed forward against the Russian fortresses of Grodno and Ossowietz. By February 20th, however, the remnant of the Russian forces—the Germans claimed to have captured 75,000 men and 300 guns—had entrenched itself along a line running southward from Kovno parallel to the Niemen, well in front of Olita, Mirosław, Druskeniki, and Grodno, and bending southwest along the northern bank of the river Bobr, north of Ossowietz, and continuing to the north of the Narew. General von Eichorn, continuing to press forward in the north, won on February 20th a foothold on the eastern bank of the Niemen north of Grodno and reached a point only 10 miles from the Warsaw-Petrograd Railway. Simultaneously von Buelow began to bombard Ossowietz. Both on the Niemen and on the Bobr (at Ossowietz) the Germans encountered such stubborn resistance that they fell back, in March, towards their own frontier.

THE BATTLE OF PRZASNYSZ. The attack on the

Niemen and on the Bobr rivers had expelled the Russians from the Kaiser's "beloved" province of East Prussia; it had furthermore drawn General Ruzsky's attention to his extreme right. In the hope that the Russian forces west and north of Warsaw had been depleted to reinforce the Bobr and Niemen lines, von Hindenburg now swiftly struck at Przasnysz, between Ostrolenka and Mława, 50 or 60 miles north of Warsaw. The admirably laid-out strategic railways of East Prussia would enable him suddenly to shift the weight of the East Prussian attack from the east to the west. By an unexpected stroke he would cross the Narew River southeast of Przasnysz and cut the Warsaw-Bielostock-Petrograd Railway to the south of the Narew. Warsaw could then be encircled and invested. The Russian army which in January had moved northwestward along the Vistula to within 40 miles of Thorn, and had been pushed back in February to Plock and Raciaz, 60 miles northwest of Warsaw, would be compelled by this flanking movement to retreat in hot haste; if von Hindenburg moved swiftly enough the Plock-Raciaz army might be enveloped and destroyed. On February 22nd, just as the attack on the Niemen and on the Bobr was expiring, two German army corps from the direction of Soldau and Willenburg (on the southern border of East Prussia) began their march southward on Przasnysz. At first things went splendidly. Przasnysz was captured on February 24th together with about half of the brigade which had been left to defend the town; Krasnosielce was occupied on the way from Przasnysz to the fortress of Ostrolenka; the only real resistance was encountered at the hands of a single Russian division which stubbornly held its ground on the ridge southwest of Przasnysz. But on the evening of February 24th Russian reinforcements began to arrive from Ostrolenka, Rozan, and Pultusk. The gallant defenders of the ridge, after battling for almost two days against overwhelming odds, were now relieved. Przasnysz and Krasnosielce were recovered on February 27th. Ten thousand Germans were captured, according to the Russian statement. By February 28th the Germans were in full retreat towards the East Prussian frontier. The three phases of the German winter campaign in Poland and East Prussia may now be summed up: von Mackensen's desperate frontal attack on Warsaw had been thwarted; East Prussia had been cleared of invaders; and a brilliantly conceived flank attack on the Russian centre had met with disaster.

(3) *The Russians in Galicia and Bukovina: January-April.*

It has already been explained that one of the principal motives for the German offensives in Poland and East Prussia was to relieve the pressure on Austria-Hungary. At the beginning of January General Brussilov's Russian army on the northern side of the Carpathian ridge was threatening to penetrate through the central Carpathian passes (Dukla Pass, Lupkow Pass, and Uzsok Pass), south of Przemyśl and to pour down the converging valleys of the mountain streams into the valley of the Theiss and the Hungarian plain.* Simultaneously Russian troops were overrunning Bukovina, which commanded the

* See sketch map on p. 715.

southeastern end of the Carpathian barrier. The Russian force in Bukovina was only 15 or 20 thousand strong, but it succeeded on January 6th in capturing the town of Kimpolung, at the southern extremity of the province; the northern part of Bukovina had been held by the Russians since September, 1914; on January 17th the Russians gained the pass of Kirlibaba, leading from the southeastern part of Bukovina westward into Hungary. With the Russians successfully occupying the very provinces—Bukovina and Transylvania—which Rumania coveted for herself, Rumania was likely to enter the war and coöperate with the Russians, turning the eastern flank of the Carpathian ridge, while the Russians swarmed over the central Carpathian passes. The situation called for strenuous and immediate action on the part of Austria-Hungary. The supersession of Count Berchtold by Baron Stephan Burian, a friend and compatriot of the Hungarian premier (Count Tisza), as foreign minister of the Dual Monarchy, January 13th, was interpreted as a sign of the Emperor's determination to defend Hungary at all costs. While von Hindenburg prepared to distract the attention of the Russians by attacks in Poland (*supra*), Archduke Eugene of Austria marshaled his forces in three great armies for a supreme effort to secure the Carpathian ridge, relieve the hard-pressed garrison of Przemyśl, free Bukovina, and intimidate Rumania. In the second half of January the campaign was launched. The first Austrian army, under General Boehm-Ermolli, moved up into the three central Carpathian passes (Dukla, Lupkow, and Uzsok) with the object of advancing north to the relief of Przemyśl. The second Austro-German army, under the command of the German General von Linsingen, operated from Munkacs northward in the passes east of Uzsok. The third army, comprising both German and Austro-Hungarian troops, was led by General von Pflanzer against the Russians in Bukovina. General von Pflanzer made rapid progress. Kirlibaba Pass was retaken; the weak Russian defense of Czernowitz succumbed on February 18th; and the Austro-Germans turned northeastward into Galicia, passing Kolomea, and holding the important railway centre of Stanislaw (70 miles southeast of Lemberg) for a brief space, until they were forced back on Kolomea, March 3rd. General von Linsingen, however, failed dismally in his attempt to advance from Munkacs toward Lemberg. Even more disappointing was the result of General Boehm-Ermolli's campaign against the central passes: after two months of bitter battles in the snow-bound mountain defiles, the Russians at the end of the third week of March still held the Dukla Pass and the northern entrance to Lupkow.

FALL OF PRZEMYSL. The culminating failure of the Austrian counter-offensive and the crowning success of the Russian Galician campaign in the spring of 1915 was the surrender of the Austrian fortress of Przemyśl, March 22nd, which had been besieged by the Russians ever since Nov. 12, 1914. The situation of the beleaguered garrison had become alarming early in March, 1915. After a breach had been effected by the Russians in the outer ring of defenses, March 13th, General von Kusmanek had ordered a last desperate sortie, March 18th. This failing disastrously, he destroyed the re-

maining stores of ammunition, and surrendered the city, March 22nd. By the capture of Przemyśl the Russians won 120,000 prisoners, about a thousand guns, and less important stores of small arms and ammunition. More important still, the railway leading westward from Lemberg through Przemyśl to Tarnow and Cracow was at last cleared, and General Selivanov's army of 100,000 men was released for aggression elsewhere. The Russians profited by their improved position to renew the offensive in the Carpathian passes, and by the end of April they were in possession of the Carpathian crest for 75 miles, commanding Dukla, Lupkow, and Rostok passes, and were fiercely attacking Uzsok Pass.

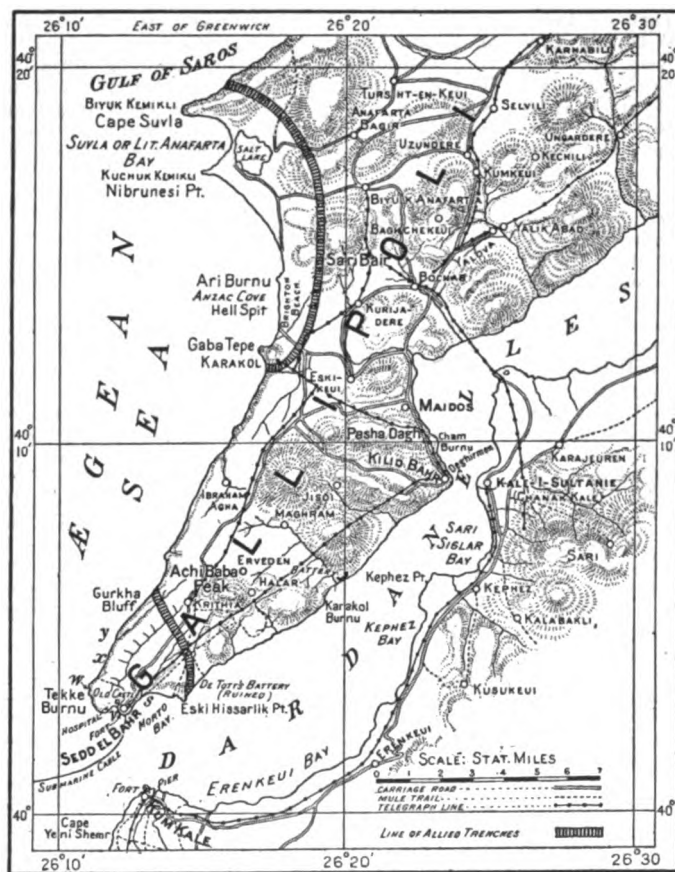
(4) *The Dardanelles: February-June.*

THE NAVAL ATTACK (FEBRUARY-MARCH). Of the three great aggressive movements by which the Triple Entente hoped, during the first three months of 1915, at the same time to weaken their enemies and to convert Italy, Rumania, and Greece from hesitant friends into active allies, two have already been described, viz., the Anglo-French offensive in the western theatre of war, and the Russian advance in Galicia. The third, the attack on the Dardanelles, although of secondary magnitude in respect of the forces engaged, was of primary importance both as regarded its immediate strategic aims and its indirect political consequences. Forcing the Dardanelles, the British Admiralty had every reason to believe, would be a difficult and hazardous operation. To be sure, a British squadron under the command of the gallant Admiral Duckworth had accomplished the feat in 1807; but since then ineffective, antiquated fortifications in the straits had been replaced by the most modern and scientific defensive works; expert German advisers had directed the emplacement of formidable batteries to command the approach by land and sea; and 14-inch Krupp guns would now be trained on an invading fleet. But if the hazard was great, the stakes to be won were still greater. Once through the Dardanelles straits, a victorious fleet would have Constantinople at its mercy, and Turkey, if not totally eliminated from the war, would at the very least be cut in two and gravely crippled. All serious danger of Turkish attacks on Egypt, Persia, or India would have been obviated. The Russian armies in the Caucasus region could be partly withdrawn and sent to reinforce the line in Poland. Moreover, the straits being opened, Russia would at last find a free outlet for her stores of wheat. The guns and ammunition of which the Russian army was in sore need could now be freely and cheaply imported by way of the Dardanelles, as fast as the factories of France, England, and America could turn them out. The moral effect of the capture of Constantinople would be tremendous. Not only would it put new life into discouraged patriots in France, Russia, and Great Britain; not only would it be an object lesson teaching awe-struck respect to the Mohammedan millions in Egypt and in India; it would also, by increasing the probability of the Entente's ultimate victory, hasten the decision of Italy to join the winning side. But most important of all, it would probably bring the Balkan nations into the war on the side of the Entente; wavering Greece and

Rumania needed only such a victory to convince them that it would be safe to join the Entente; and Bulgaria, suspected of secret leanings toward the Central Powers, would not dare to oppose the Entente Allies, for Greece, Serbia, Rumania, and the Allied forces at Constantinople would completely encircle and crush her.

wide, and was defended by forts at Cape Helles and Sedd-el-Bahr on the tip of the Gallipoli Peninsula, on the northern side, and by forts Kum Kale and Orkanieh, on the southern or Asiatic side. At Sedd-el-Bahr there were six 10.2-inch guns; at Cape Helles, two 9.2-inch guns; at Kum Kale four 10.2- and two 5.9-inch

guns; and at Orkanieh two 9.2-inch guns. On February 19th, the fleet began a heavy bombardment of these outer forts. As the batteries on shore were enormously outnumbered and outranged by the guns of the battleships, the Turks made no effort to reply to the bombardment, until in the afternoon, when the British Admiral Carden (who was later superseded by De Robeck), thinking he had put the forts out of action, ordered his ships to steam in close to shore in order to clinch the victory. Twilight came before either the forts or the ships could score any important success. The second attack on the four outer forts was delivered on February 25th. This time the superiority of the Allies' guns was utilized with greater effect. The *Queen Elizabeth*, safe out of range of the land guns, rained 15-inch shells on the Turkish gunners at Cape Helles. The *Agamemnon*, the *Irresistible*, and the *Gaulois* shelled the forts with comparative safety from a somewhat shorter distance, the only casualty being the loss of three men killed and five wounded on board the *Agamemnon*, caused by the bursting of one well-directed Turkish shell. About noon the *Vengeance*, *Cornwallis*, *Suffren*, *Charlemagne*, and a little later *Triumph* and *Albion*, steamed in close to the



THE DARDANELLES CAMPAIGN, 1915

For the sake of so momentous a victory, the British Admiralty risked a powerful fleet in the attack on the Dardanelles. During February the warships which had been watching the Dardanelles since the beginning of the war were reinforced by new arrivals, until, at the time the principal attack was delivered, Vice Admiral John Michael De Robeck could command 13 British battleships—including the newly-constructed super-dreadnought *Queen Elizabeth* with her eight 15-inch guns, besides the *Inflexible*, *Agamemnon*, *Cornwallis*, *Vengeance*, *Triumph*, *Irresistible*, *Albion*, *Ocean*, *Lord Nelson*, *Prince George*, *Majestic*, and *Swiftsure*. In addition, the French Rear Admiral Guépratte had the French battleships *Bouvet*, *Suffren*, *Gaulois*, and *Charlemagne*. Altogether the Allied fleet mounted, besides the powerful 15-inch guns of the *Queen Elizabeth*, almost 70 12-inch guns and an even greater number of secondary guns. The first task which the Anglo-French fleet set itself to accomplish was the reduction of the outer forts of the Dardanelles. The entrance to the Dardanelles is about two and three-eighths miles

wide, and was defended by forts at Cape Helles and Sedd-el-Bahr on the tip of the Gallipoli Peninsula, on the northern side, and by forts Kum Kale and Orkanieh, on the southern or Asiatic side. At Sedd-el-Bahr there were six 10.2-inch guns; at Cape Helles, two 9.2-inch guns; at Kum Kale four 10.2- and two 5.9-inch guns; and at Orkanieh two 9.2-inch guns. On February 19th, the fleet began a heavy bombardment of these outer forts. As the batteries on shore were enormously outnumbered and outranged by the guns of the battleships, the Turks made no effort to reply to the bombardment, until in the afternoon, when the British Admiral Carden (who was later superseded by De Robeck), thinking he had put the forts out of action, ordered his ships to steam in close to shore in order to clinch the victory. Twilight came before either the forts or the ships could score any important success. The second attack on the four outer forts was delivered on February 25th. This time the superiority of the Allies' guns was utilized with greater effect. The *Queen Elizabeth*, safe out of range of the land guns, rained 15-inch shells on the Turkish gunners at Cape Helles. The *Agamemnon*, the *Irresistible*, and the *Gaulois* shelled the forts with comparative safety from a somewhat shorter distance, the only casualty being the loss of three men killed and five wounded on board the *Agamemnon*, caused by the bursting of one well-directed Turkish shell. About noon the *Vengeance*, *Cornwallis*, *Suffren*, *Charlemagne*, and a little later *Triumph* and *Albion*, steamed in close to the

forts at the entrance to the Dardanelles had been mere outposts, designed to delay rather than to stop the invader. The decisive battle would be the battle for the Narrows. On March 6th, while the *Vengeance*, *Albion*, *Majestic*, *Prince George*, and *Suffren* steamed up into the straits and engaged the subsidiary forts just below Chanak and Kilid Bahr, the *Queen Elizabeth*, *Agamemnon*, and *Ocean*, lying in the Gulf of Saros, trained their powerful guns on the forts at Chanak. As the hills of the Gallipoli Peninsula lay between the three last mentioned ships and their target, the bombardment was directed entirely by aeroplane observation. On March 7th, the forts at the Narrows were again subjected to bombardment. At the close of the day's action, the British withdrew in elation, believing that they had put the Chanak forts out of commission without losing a single ship, and sustaining only slight injuries to the *Gaulois*, *Agamemnon*, and *Lord Nelson*. London was jubilant at the news. By March 18th all was ready for the supreme effort which would carry the Anglo-French fleet past the dangerous Narrows and on into the Sea of Marmora. With the advantages of a calm sea and a clear sky in their favor, the *Queen Elizabeth*, *Inflexible*, *Agamemnon*, *Triumph*, *Prince George*, and *Lord Nelson* entered the straits and took up a position 7 or 8 miles distant from the Narrows. A little over an hour later, a second squadron, composed of the four French ships, steamed up in front of the English ships and from a closer range concentrated their fire against the Turkish forts. As the forts ceased firing the fleet opened the third and culminating phase of the attack. Six English battleships, the *Albion*, *Vengeance*, *Sucifure*, *Majestic*, *Ocean*, and *Irresistible*, were to close in on the Narrows forts. The French squadron had to shift its position to make way for this new attack. Then suddenly forts which were supposed to have been dismantled blazed forth again. Floating mines were sent down the channel (being carried by the current which runs toward the *Ægean*). Three large shells and a mine simultaneously struck the French ship *Bouvet*. Within three minutes, almost before the echoes of the mighty explosion had died and the cloud of smoke cleared away, the *Bouvet* sank, with her crew on board. Another mine hit the *Irresistible*; but the crew of the British ship was picked up by destroyers, under fire. The next victim was the *Ocean*, suddenly sunk by a mine. Meanwhile the Turkish guns had proved unable to sink any of the attacking battleships, but they had set the *Inflexible* on fire, opened a great gap in the armor-plate of the *Gaulois*, and inflicted severe punishment on other ships. At twilight the great fleet quietly steamed out of the straits, followed by a salvo of parting shots from the forts which the fleet had striven to annihilate. More than two thousand men and three battleships had been sacrificed in vain.

Instead of admitting defeat and abandoning the Dardanelles campaign entirely, however, the Allies, probably at the insistent demand of the British government, decided to land troops on the Gallipoli Peninsula in the hope that a land attack might succeed where the navy had failed. From March 18th to April 25th, while it waited for troops to arrive on the scene, the Allied fleet continued a desultory bombardment of the forts inside the straits and prevented the Turks from

repairing the ruined forts at Kum Kale and Sedd-el-Bahr. Smyrna was shelled by way of diversion. A British submarine, the *E-15*, was unluckily grounded and had to be blown up, lest it should fall into the possession of the Turks.

THE LAND ATTACK ON THE DARDANELLES (APRIL-JUNE). The land attack on the Dardanelles was undertaken at the end of April by an Anglo-French expeditionary force of 120,000 men under the command of Gen. Sir Ian Hamilton. The expeditionary force was a motley affair, made up of an Australian division, a New Zealand division, a detachment of Indian troops, a division of British Territorials, the British Naval Division (which had been sent to Antwerp at an earlier stage of the war), and the 29th Division of the British army. As General Joffre was unwilling to spare any regular troops from the battle line in France, the French contributed only a small detachment of *Fusiliers Marins*, colonials, and the Foreign Legion. This heterogeneous aggregation, amounting in all to three army corps, was destined to attack a much stronger Turkish army, commanded by a skillful German General, Liman von Sanders, and ensconced in practically impregnable positions. The Gallipoli Peninsula extends southwest from its neck at Bulair about 45 miles to its tip at Cape Helles (near Sedd-el-Bahr), broadening out from 3 miles in width (at a point just west of Bulair) to more than 10 miles (in the middle) and then narrowing down again towards the tip. The tip of the peninsula strongly resembles a human foot, with its heel almost closing the straits at Kilid Bahr, and its toe at Sedd-el-Bahr. Just where the ankle bone ought to be, we find the hill called Pasha Dag. Down nearer the toe is another hill, Achi Baba, dominating the town of Krithia. Above the ankle is the hill of Sari Bair. The ultimate aim of the expeditionary force was to capture the forts at the heel of the foot, at Kilid Bahr, either by directly attacking or by encircling and isolating them. Three plans of campaign are suggested by a glance at the map.

(1) An army might be landed near Bulair and work back down into the peninsula cutting communications with Constantinople and taking the forts in the rear. (2) Armies might be landed along the ankle and shin—to continue the metaphor of the foot—at Gaba Tepe, Ari Burnu, and Suvla Bay, and fight their way across the ankle, first capturing the hill of Sari Bair, over to Maidos and Kilid Bahr. (3) A frontal attack might be made, beginning at the tip of the toe, and encountering the strong Turkish positions at Achi Baba and, 5 miles further on, at Pasha Dag. Sir Ian Hamilton elected to combine the second and third plans. On a beautiful Sunday morning, at daybreak, April 25th, British troops were landed at six different points on the Gallipoli Peninsula, while French troops were disembarked on the Asiatic coast at Kum Kale. One of the British landing parties, made up of Australian and New Zealand troops, landed at Ari Burnu to fight their way across the ankle. (The landing beach was called Anzac Cove, the name "anzac" being composed of the initials of "Australian and New Zealand Army Corps.") The other five British landings, at beaches "Y," "X," "W," "V," and "S," were all directed against the toe of the foot. At Ari Burnu, north of Gaba Tepe, the Australasian landing party gallantly charged up the beach

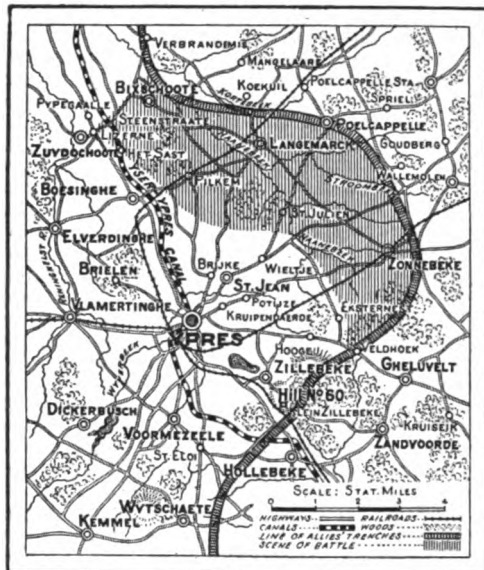
under heavy fire, ousted the Turkish riflemen from their trenches, and then scrambled up the cliffs which rose abruptly 40 feet from the water's edge. There the Australasians withstood a fierce Turkish counter-attack, February 26th, made good their position, and feverishly proceeded with the work of constructing trenches. At Beach "Y," which is due east of Krithia, the landing was easily accomplished, but a Turkish counter-attack compelled the landing party to reembark, leaving the Turks in undisputed possession of the beach. At beach "X" the landing party was strongly assailed, but held its ground. At beach "W" the troops were caught in wire entanglements and mowed down by concealed machine guns, but the position won on the shore was maintained against all attacks. The landing at beach "V," close to Sedd-el-Bahr, was perhaps the most difficult of all, and was accomplished only with severe losses. At beach "S," near Eski Hissarlik Point, the landing was successfully accomplished from trawlers. The French landing party at Kum Kale was brilliantly successful; after capturing 500 prisoners, the French troops were able to come to the assistance of the British at beach "S" and take up a position on the extreme right of the line. The landing parties from beaches "S," "V," "W," and "X" advanced together, April 28th, in the direction of Krithia, until the Anglo-French line ran from a point 3 miles north of Cape Tekke, on the Ægean side, to a point 1 mile north of Eski Hissarlik, on the Dardanelles side. By May 1st, practically the entire expeditionary force had been landed; the Australasian Corps had entrenched itself north of Gaba Tepe, its purpose being to hold the attention of as many Turkish troops as possible, while the main Anglo-French force at the toe of the peninsula, approximately two army corps, delivered the principal attack on the Turkish position at Krithia. By moonlight, May 1st, the Turks made a determined effort to dislodge the invader south of Krithia. Furious bayonet charges pierced the line of British and French trenches, but at dawn of May 2nd the Allies rallied for a counter-attack which forced the Turks to retire precipitately. In a three-day battle, May 6-8, the Anglo-French line made a supreme attempt to expel the Turks from Krithia. By dint of desperate infantry charges, covered by field and naval artillery, the Allies were barely able to advance a thousand yards. To their intense disappointment and chagrin they realized that the terrain had been carefully prepared by expert engineers; wire entanglements, concealed trenches, and hidden batteries were encountered at every turn. The Turkish guns on the hill of Achi Baba commanded the whole position, and were so well protected that even the heavy guns of the British dreadnoughts, which assisted in the attack, could not disable them. In the secondary theatre of operations at Gaba Tepe, the Australasian corps captured three lines of Turkish trenches on the slopes of Sari Bair, and immediately lost them, May 9-10. Ten days later, May 19th, the Turks fiercely attacked the trenches which the Australasian troops had hastily dug in the form of a great semi-circle about the landing beach. The Australasians manfully stood their ground, and by night the Turks were forced to admit defeat, leaving over 7000 of their men (according to British reports) killed or wounded on the field of battle. Mean-

while the fighting on the Krithia front had continued without decisive results. An important advance was made on May 28th by the French troops (on the extreme right of the battle line), who after many bootless attempts at last succeeded in capturing "Le Haricot," a redoubt which the Turks had concealed on the western slope of the Kereves Dere Valley. A third general attack on the Krithia line was ordered by Gen. Sir Ian Hamilton for June 4th. On a front of 3 miles the British line was moved forward about 500 yards, but the French lost "Le Haricot." The battle of June 4th marked the failure of the Allies' campaign on the tip of Gallipoli: three bloody battles had been fought, ammunition had been wasted in terrific bombardments, and somewhere between 40,000 and 70,000 men had been sacrificed; yet the principal Turkish position at Achi Baba remained unconquered and unconquerable, blocking the path to Kilid Bahr. Furthermore, support for the land forces was no longer to be had from the big guns of the fleet; for after the loss of three battleships in May—the *Goliath*, torpedoed by a Turkish destroyer, May 12th; the *Triumph*, torpedoed by a German submarine in full daylight, while numerous destroyers were on the lookout, May 26th; and the *Majestic*, torpedoed, probably by the same submarine, May 27th—the *Queen Elizabeth* and the more powerful of the battleships prudently withdrew from the Ægean, leaving at the Dardanelles only a few battleships of antiquated type, with a number of French and British cruisers, a flotilla of destroyers, a monitor, and some submarines. At the end of April, it should be remarked, two British submarines had covered themselves with glory by raiding the Sea of Marmora. The *E-14*, commanded by Edward C. Boyle, had penetrated the Narrows, entered the Sea of Marmora, sunk two Turkish gunboats and a transport, and returned safely. The *E-11*, commanded by Eric Naismith, had done even better, sinking three Turkish transports, three store ships, and a gunboat.

(5) *The Second Battle of Ypres: April-May.*

The failure to force the Dardanelles was only one item in the long list of disappointments which the Allies experienced in 1915. First the long-expected "spring offensive" in France had netted the British one little village, Neuve Chapelle, March 10th. The French had not been much more successful. Then the Dardanelles naval attack had proved futile, March 18th. The assistance so impatiently expected at the beginning of the year from Rumania and Greece was never proffered. Italy delayed entering the war until the end of May. And meanwhile the Russian campaign in Galicia, so promising in March, met with terrible disaster in May, as will presently appear, and disheartening news came from the Western front. At the very time when military critics in England and France were pointing out that General Joffre's "nibbling" tactics were wearing down the strength of the German line in the West, a new blow was delivered with tremendous force by the German army in Belgium. On April 17th the British sappers had blown up the German trenches on Hill 60, a little more than 2 miles southeast of Ypres, and the summit had been occupied by British infantry. Failing to retake Hill 60 by reckless infantry assaults and by furious

artillery bombardment, the Germans on the evening of April 22nd suddenly attacked the opposite side of the "Ypres salient," and crumpled up the northern arc of the roughly semi-



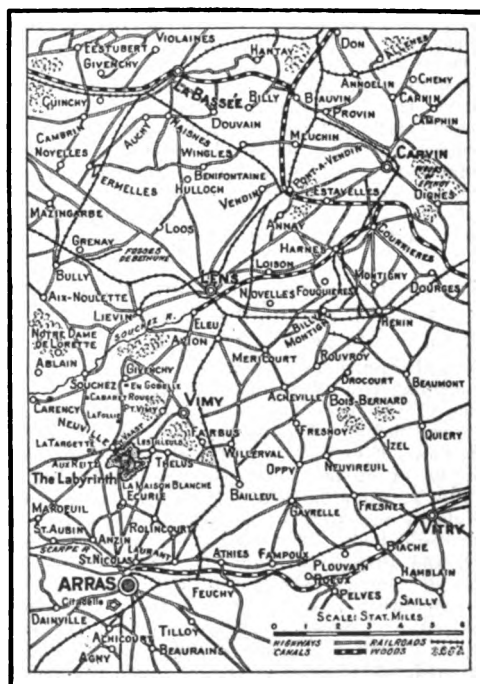
THE SECOND BATTLE OF YPRES, APRIL-MAY, 1915

circular line in front of Ypres. This time the way for the infantry attack had been prepared, not by artillery, but by a cloud of greenish vapor, which a gentle breeze wafted towards the Allies' trenches. The vapor, as the Allied troops soon learned to their amazement and consternation, was chlorine gas, which chokes and asphyxiates with horrible effect. The French troops holding the line from Steenstraete to Langemark, north of Ypres, broke and fled before this novel and peculiarly cruel form of attack. The Canadian troops holding the line southeast of the French were less seriously affected by the gas-attack, but the precipitate retreat of the French had uncovered the left wing of the Canadian division. For a time the situation of the Allied line east of Ypres was most perilous. To the north of the city, the Germans had crossed the Yser Canal and obtained a foothold at Lizerne. If the Germans could advance but a few miles further into the breach made by the chlorine fumes, the Canadians would be encircled and the other Allied forces on the Ypres salient, from Broodseinde to Hill 60, would be able to extricate themselves only with extreme difficulty. The situation was saved by the gallant resistance of the Canadians, and by the timely arrival of five British battalions under Colonel Geddes to fill in the gap between the Canadians and the Yser Canal. But, on April 24th, the Allies were again driven back, choking and gasping, by another cloud of chlorine gas. St. Julien was abandoned to the Germans, February 24th. By May 3rd Grafenstafel, Zonnebeke, Westhoek, and Veldhoek had been relinquished. Hill 60 was captured by the Germans May 5th. New German assaults on May 8th and 9th forced the British back from Frezenberg to Verlorenhoek. On May 13th British cavalry brigades (dismounted), holding the

line from Hooze to Verlorenhoek, were badly battered. On May 24th the gas attack was vigorously renewed. But early in June the battle may be said to have died away, leaving the Ypres salient very much reduced, but still intact, with Bixchoote and Lizerne once more in the Allies' hands, Pilkem, St. Julien, Zonnebeke, Veldhoek, and Hill 60 in German possession. The significance of the battle of Ypres, however, lay not so much in the loss of ground to the Germans, as in the convincing demonstration of the ability of the German army to assume the offensive against superior numbers, relying on its own superior mechanical equipment. Henceforth the Allies, and above all the British, labored with feverish anxiety to supply the equipment of hand-grenades, bombs, high explosive shells, machine guns, and respirators (for protection against chlorine attacks), without which attacks against the German lines were foredoomed to costly failure.

(6) The Battle of Artois: May-June.

If any further demonstration were needed of the advantage which the Germans derived from their superior technique in the art of trench warfare, the results of the Allied offensive in May and June supplied it. In May, after the first fury of the German attack on Ypres had spent itself, General Foch, commanding the "northern sector," ordered the resumption of the Allied offensive. On May 9 the French just north of Arras and the British further north



THE SCENE OF THE BATTLE OF ARTOIS, MAY-JUNE, 1915

in the vicinity of Neuve Chapelle, simultaneously assailed the German lines. The immediate object of the French attack was the important railway centre of Lens; that of the Brit-

ish was the Aubers ridge east of Neuve Chapelle. If successful, from Lens and Aubers the Allies could press on towards Lille. By the evening of May 12th, Carency, the fortified chapel of Notre-Dame de Lorette, and the cemetery of Neuville St. Vaast had fallen into French hands. From May 13 to the third week in June the French were engaged in capturing the isolated fortins or redoubts which the German engineers had constructed with astounding ingenuity, blocking the way to Lens. By the middle of June the most formidable of these defensive works, the so-called "Labyrinth" (between Arras and Neuville St. Vaast)—an intricate maze of trenches and subterranean tunnels—was mastered by the French. But Lens remained uncaptured. The British in the meantime had failed in their first assault on the Aubers ridge, May 9th, because of insufficient artillery preparation. A second assault on the German lines was delivered by the British at a point a little further south, May 16th. This second assault, "the battle of Festubert," continuing for 10 days, placed the British in possession of "the entire first-line system of trenches" on a front of 3200 yards, according to Sir John French's report, and of the first and second lines of German trenches on a front of two miles more. It was a distinct victory, but the objective of the attack had not been gained, and the British had once more been forced to admit the superiority of the German technique in trench warfare. The only other important fighting on the Western front during the summer was the German offensive conducted by the Crown Prince in the Argonne from June 20th to the middle of July. The German front in the Argonne, as the result of the midsummer battle, was advanced about 400 yards; the forces engaged, however, were relatively small, and the strategic idea obscure. A British historian derisively describes the Argonne battle as "an attempt to retrieve a somewhat damaged reputation on the part of a general (the Crown Prince), whom birth had cast for a part he could not fill."

(7) *Von Mackensen's Drive in Galicia: May-June.*

While in the West and on Gallipoli, the British and French armies were meeting with discouraging results, in Galicia the Russian armies of General Ivanov were sustaining a disastrous defeat. Up to the end of April, the Russian offensive, in spite of the inadequate supply of munition which hampered General Ivanov's campaign in Galicia, seemed to offer the brightest prospects of success to which the Allies could look. The "military experts" of English and French journals optimistically debated the question whether Cracow or Hungary would be General Ivanov's next objective. Then suddenly the amazing news was received that the Russian armies in Galicia were in full retreat, pursued relentlessly by General von Mackensen. The reason for the surprise was simple. With marvelous secrecy and speed Austrian and German armies, aggregating about 2,000,000 men, had been concentrated for a prodigious blow in Galicia. Probably as many as 1500 heavy guns, and thousands of lighter field pieces, with unlimited supplies of ammunition, had been placed in position. The whole group of Aus-

tro-German armies—including von Woyrsch's army operating north of the Galician frontier, Archduke Joseph Ferdinand's, and von Mackensen's own armies—concentrated east of Cracow between the Vistula and the Carpathians, Boehm-Ermolli attacking northward in the central Carpathians, von Linsingen further east menacing Stryj from Munkacs, and von Bothmer and von Pflanzer in the extreme east. By feints in the direction of Stryj the Russians were kept in uncertainty as to the direction from which the attack was to be delivered, if, indeed, the Russians realized at all the danger in which they stood. After a preliminary advance east of Neu Sandec towards Gorlice, the main attack began on May 1st with an artillery bombardment of unprecedented magnitude. The Russian trenches along the eastern bank of the Biala River, between Tarnow and Gorlice, were blasted out of existence. In order to visualize the operation, the north-and-south line of the Biala River between Tarnow and Grybow may be conceived as the cross-bar of a huge letter H lying on its side. The northern leg of the H was the east-and-west railway running through Tarnow; the southern leg was the parallel railway running through Novo Sandec, Grybow, and Gorlice. The brunt of the German attack was on the cross-bar of the H, south of Tarnow. In the middle of the cross-bar, the Biala River was crossed at Cieszkowice, May 2nd. Other Teutonic armies were thrown across the Donajetz River, north of Tarnow. Simultaneously an advance was made eastward along the southern leg of the H, where Gorlice was captured, May 2nd. If the legs of the H are continued eastward, a second cross-bar will be discovered in the Wisloka River, about 20 miles east of Tarnow and Gorlice. To this position the Russians fell back after the defeat of May 2nd, and in new trenches along the eastern bank of the Wisloka they waited with grim determination for von Mackensen's attack. It will be noted that Dukla Pass lies almost due south of the Wisloka cross-bar, and that if the Germans could cross the Wisloka, the Russian troops which had penetrated into Dukla Pass would be virtually cut off. Realizing this danger, the Russian defenders of the Wisloka fought desperately. But irresistibly von Mackensen pressed on until he had crossed the Wisloka at Jaslo, May 7th. The Russians from Dukla Pass fled towards the Wystok River, east of the Wisloka. Here again they were hotly pursued by a German force, which crossed the Wystok, May 8th. Large bodies of fugitive Russian troops were made captive. A considerable part, however, of the Russian Army of the Passes extricated itself in time to join the more northerly portions of Ivanov's armies in a stand on the line of the San. The centre of the Russian line, on May 12th, before the battle of the San, rested on the San River, from the fortress of Przemyśl to a point well north of Jaroslav; the right was in front of the San; the left wing was bent back behind the San. The battle of the San, one of the most momentous engagements of the war, began on May 15th with a Russian counter-attack, and ended on May 17th with the Austrians crossing the river at Jaroslav, under the personal observation of the German Emperor. Przemyśl, further south, held out until June 2. Meanwhile von Linsingen, striking north through the Carpathians, captured Stryj, June 1st, and ad-



THE GERMAN EMPEROR AND GENERAL VON MACKENSEN
The German Campaign Against Russia



Photographs by Paul Thompson

FORTIFICATIONS ON THE WEST BANK OF THE DVINA RIVER
THE WAR IN EUROPE

vanced north across the Dniester. Although von Linsingen suffered severe punishment at the hands of General Brussilov, the Austro-German advance continued to make progress. On June 20th von Mackensen captured Rawa Russka, north of Lemberg.

Von Mackensen's victory at Rawa Russka rendered Lemberg untenable and compelled the Russians to evacuate the strong line of lakes, river, and marshes which constituted the "Groddek position," just west of Lemberg. On June 22nd the Austrian General Boehm-Ermolli triumphantly reentered the city which the Russians had captured nine months before. The fall of Lemberg may be taken as the crowning achievement of the first phase of von Mackensen's great drive. The Russians had been driven out of the Carpathian passes in headlong rout, Tarnow, Jaroslav, Przemyśl, and Lemberg had been reconquered, and the Russians all but expelled from Galicia—they still held a strip of Eastern Galicia, including Sokal, Brody, and Tarnopol—within an incredibly brief space of time. At the end of June and during the first part of July, von Mackensen's battering ram was pointed north, into Russian Poland, presaging an even more ambitious Teutonic offensive.

During June alone the Teutonic forces captured 145,000 prisoners, 80 heavy guns, and 268 machine guns. In recognition of his brilliant success, von Mackensen was appointed a field marshal. Archduke Frederick, commander-in-chief of the Austrian army, was similarly honored.

(8) Italy's Intervention: May.

In May, while the Russians were in full retreat and while the British, slowly perceiving the gravity of the situation, were reconstructing their cabinet and establishing a ministry of munitions to remedy the shortage of machine guns and high explosive shells, a new factor became prominent, upon which the Allies had long counted to redress the balance of power in their favor. Belligerent speeches by Italian patriots during the winter and spring, when the situation had seemed more favorable to the Allies, had stimulated popular enthusiasm for war to such a degree that in May, in spite of the Russian retreat and the British crisis, the momentum of the anti-Austrian movement carried Italy into the war. From the *Green Book* published by the Italian government to justify the war, and from the information made public on the other side by the Austro-Hungarian and German governments, it is now possible to reconstruct at least the main outlines of the diplomatic maneuvers which preceded the Austro-Italian break. The secret Triple Alliance treaty, first negotiated in 1882, when Italy was full of resentment against France for seizing Tunis, and renewed in 1887, in 1891, in 1903, and most recently in 1912, bound Italy to the Central Powers in a defensive alliance. From clauses III and IV of the treaty (as pieced together by the *Vossische Zeitung* from the phrases disclosed in course of the negotiations in 1914-15), it appears that if either or both of her Allies, "without direct provocation on their part" should be attacked by another Power, Italy would be obliged to join in the war against the attacking Power (III). If either Ally should be forced to declare offensive war

against a Great Power which menaced its security, the other members of the Triple Alliance would either join in the war, or "maintain benevolent neutrality towards their Ally." At the outbreak of the War of the Nations, in August, 1914, Italy had remained neutral, announcing that since Germany and Austria-Hungary were engaged in an *offensive* war, the *casus foederis* of clause III did not exist. Italy was therefore obliged simply to observe "benevolent neutrality" (clause IV). As the war progressed, however, the spirit of Italy's neutrality became less and less "benevolent," and the Italian government accused Austria-Hungary of violating clause VII, which stipulated that as far as the "territorial *status quo* in the East" was concerned, the Allies "will give reciprocally all information calculated to enlighten each other concerning their own intentions and those of other Powers." "Should, however, the case arise that, in the course of events, the maintenance of the *status quo* in the territory of the Balkans or of the Ottoman coasts and islands in the Adriatic, or the *Ægean* Sea become impossible, and that, either in consequence of the action of a third Power, or for any other reason, Austria-Hungary or Italy should be obliged to change the *status quo* for their part by a temporary or a permanent occupation, such occupation would take place only after *previous agreement* between the two Powers, which would have to be based upon the principle of a *reciprocal compensation* for all territorial or other advantages that either of them might acquire over and above the existing *status quo*, and would have to satisfy the interests and rightful claims of both parties." The clause had been invoked by Austria-Hungary in the Turco-Italian War to restrict Italy's operations against Turkey. It was now invoked by Italy, in December, 1914, to justify a demand for "compensation," since the Austro-Hungarian government had failed to inform Italy in advance of the intention to send an ultimatum to Serbia, and had failed to arrange to compensate Italy for the new advantage which the attack on Serbia would give to the Dual Monarchy. The Austro-Hungarian government could retort that Italy had been informed as early as the summer of 1913 of Austria-Hungary's intention of taking action against the Serbian menace (this fact was referred to by Signor Giolitti in a speech before the Italian Chamber of Deputies in December, 1914). Furthermore, no "temporary occupation" of Serbian territory existed, and the Austro-Hungarian government had declared its intention of respecting Serbia's territorial integrity. The Italian government, however, persisted in its demands. The port of Avlona on the Albanian coast, whither an Italian landing party was dispatched late in December, 1914 (see ALBANIA), would only partially compensate Italy. In addition, Austria-Hungary would have to cede to Italy the Italian speaking districts around Trent and a strip of land along the Isonzo River. This amazing interpretation of the Triple Alliance treaty was accepted in principle by the Austro-Hungarian government on March 9th, but only after a new Austro-Hungarian foreign minister had been appointed (see AUSTRIA-HUNGARY). The German government, which had consistently advised the conciliation of Italy, and had sent Prince von Buelow to urge moderation in Rome, offered to

guarantee the execution of whatever terms should be agreed upon. The Italian demands, as formulated finally in April, embraced (1) the cession of the Trentino including the towns of Rovereto, Trent, and Bozen; (2) an extension of the eastern Italian frontier along the Isonzo River to include the strong positions of Tolmino, Gorizia, Gradisca, Plezzo, Monfalcone, and Malborghetto; (3) the erection of Trieste into an autonomous state; (4) the cession of several Dalmatian Islands; (5) the recognition of Italian sovereignty over Avlona, and the declaration of Austria-Hungary's disinterestedness in Albania. At first Austria-Hungary absolutely refused the second, third, and fourth demands, and modified the first by reserving Bozen. On May 4th Italy denounced her treaty of alliance with Austria-Hungary. Unmistakable preparations for war were pushed forward. Before the final rupture, Austria-Hungary made a last attempt to purchase Italy's neutrality, according to a statement made by von Bethmann-Hollweg, May 18th, by offering (1) the Italian part of the Tyrol; (2) the western bank of the Isonzo, "in so far as the population is purely Italian," and the town of Gradisca; (3) sovereignty over Avlona and a free hand in Albania; (4) special privileges for Italian nationals in the Dual Monarchy, and amnesty for political prisoners who were natives of the ceded provinces; (5) "Trieste to be made an imperial free city, receiving an administration giving an Italian character to the city, and to have an Italian university." Moreover, the Austro-Hungarian government accepted the Italian demand that the concessions should be made as soon as the new boundaries could be delimited, instead of awaiting the conclusion of the war. Signor Salandra, however, having tested the strength of the war-spirit by tentatively resigning (see ITALY), was so confident of popular support that he refused to bargain longer, and on the evening of May 23rd the Italian government announced that the war against Austria-Hungary would begin the following day. Italian intervention in the war must not be regarded simply as the culmination of unsuccessful haggling over a few paltry patches of territory. Italy went to war first of all because the people had been aroused to wild enthusiasm for a war of emancipation to "redeem" the Italian populations of Trent and Trieste from the hereditary enemy of Italian national unification. At the same time chauvinistic journals had already begun to preach the doctrine that Italy as a great and growing Power must contest the possession of the Adriatic Sea with her rival Austria-Hungary, and must secure new territories outside of the Italian peninsula. While chauvinists were frankly urging an aggressive war for imperial expansion, humanitarian radicals were exhorting the Italian nation to join in the defense of civilization, democracy, and liberty against Austro-German militaristic imperialism. These three powerful sentiments—anti-Austrian nationalism, aggressive imperialism, and anti-German liberalism—enabled at least a majority of the Italian nation to accept with approval, if not with actual jubilation, the result of the diplomatic contest. The Italian declaration of war, as might have been expected, was received with delight in France and England, with deep resentment in the "Teutonic" countries. It is significant that notwithstand-

ing its abhorrence of Italy's "treachery," the German government remained at peace with Italy; a possible explanation of this anomaly might be the belief in Germany that after breaking her strength against impregnable Austrian fortifications, Italy could be induced to make peace separately, deserting the Entente Powers.

THE ITALIAN PLAN OF CAMPAIGN. Italy's entry into the war added to the Allied forces a field army of 1,000,000 with 2,000,000 reserves (territorial militia), under the nominal command of King Victor Emmanuel, and the actual command of Count Luigi Cadorna, and a navy comprising 4 dreadnoughts, 10 older battleships, 20 submarines, 40 destroyers, and other craft, under the command of the Duke of the Abruzzi. Austria-Hungary at the outset was too much occupied in the Galician campaign (*supra*) to take the offensive against Italy, and contented herself with a naval and aerial raid on the Italian coast, from Venice to Brindisi, early in the morning of May 24th. Against Austria-Hungary's weakened resistance, it was predicted that Count Cadorna's army would make brilliant progress. His plan of campaign was largely determined by geographic factors. The main strength of the Italian army was concentrated at the railheads along the southeastern portion of the Austro-Italian frontier, for an attack in force against the Isonzo River, just east of the border line. Within a week the Italian armies had penetrated Austrian territory as far as the Isonzo and were ready to assail the main Austrian defenses, the fortified heights east of the Isonzo, from Monte Nero in the north to Monfalcone and the Carso plateau on the coast: if this line could be carried, the way would be opened for the capture of Trieste and the invasion of Carniola. Against the middle sector of the Austro-Italian frontier, which is simply a northward-bulging mountain ridge, General Cadorna sent only a comparatively thin line of troops, with the commission of guarding the passes and preventing an Austrian counter-invasion. In the first week of the war the Italians possessed themselves of the mountain pass called Val d'Inferno in the centre of the middle sector, and captured Cortina, in the Val d'Ampezzo, at the southern entrance to the Strada d'Allemagna, an important pass at the western end of the sector. The third or western sector of the Austro-Italian frontier was formed by the irregular triangle of the Trentino, jutting southward into Italy. The strong popular sentiment demanding the "liberation" of the Italian inhabitants of the Trentino, taken in combination with the military necessity of forestalling an Austrian invasion from commanding heights of Trentino, furnished ample justification for an Italian offensive in this region. With Trent as its ultimate objective, one Italian army penetrated the blunt apex of the triangle, following up the valley of the river Adige and the basin of Lake Garda towards Rovereto and Riva. Simultaneously small parties of Italian mountaineers attacked the mountain passes along both sides of the triangle, threatening Trent from the east and from the west.

(9) *Lull in the Serbian Operations: January-September*

After the exhausting campaign of December, 1914 (described in the YEAR BOOK for 1914),

when the retreating Serbian armies had suddenly rallied, surprised the too confident invader by the vigor of their attack, and swiftly expelled him from Serbian territory, a period of inaction ensued in the Serbian theatre of war. Serbs and Austrians alike had suffered heavily and needed time to repair their losses. Inclement weather and impassable roads added to the disinclination of either party to renew active operations. About the end of January consternation was caused in Serbia and in the other Balkan countries by the report that an immense Austro-German army was being massed for a new invasion of Serbia. The story may have been a canard, fabricated for the simple purpose of intimidating Rumania and Greece—for Rumania and Greece then appeared to be on the point of joining the Triple Entente—or possibly the movement of German troops preparatory to the great offensive movement against Russia was honestly misinterpreted by the press. At any rate, rumor of an impending Austro-German invasion of Serbia in the spring of 1915 was not borne out by the facts. The diplomatic correspondence published in the Italian *Green Book* throws some light on the situation. According to the *Green Book*, the Italian government on February 17th warned Austria-Hungary that any military action undertaken by that Power in the Balkans without previous agreement regarding the compensation to be allowed Italy, would lead to grave consequences. In other words, Italy warned Austria-Hungary that the inauguration of a new campaign against Serbia would precipitate a crisis between Austria-Hungary and Italy; and Austria-Hungary, still hoping that Italy could be kept out of the war, consented to postpone the invasion of Serbia. Meanwhile, profiting by the inactivity of Austria-Hungary, Serbia not only repaired the ravages which the typhus, in combination with the past year's campaigns, had wrought in her army, but also invaded Albania, with the co-operation of Montenegrin forces (see ALBANIA, *History*). Serbian patriots began to discuss the extent of the territories that Serbia should annex at the termination of the war, and a debate was carried on between Italian and Serbian journals respecting the relative merits of the Italian and the Serbian claims to Dalmatia. The consensus of opinion seemed to sanction Italy's claim to a predominant position on the eastern coast of the Adriatic, providing that Serbia should be given access to a port. In April an Austrian aeroplane raid on Podgoritz, Montenegro, resulted in 137 casualties, of which 28 were fatal. In August, after a lapse of many months, the Austrians resumed the bombardment of Belgrade with heavy howitzers. The bombardment was presently discontinued, however, and the Serbian front remained comparatively quiet until October.

(10) *Von Hindenburg's Drive: August-September.*

General Strategy. In July and August, while the Italians were pushing their campaign for Trent and Trieste, and while the Franco-British line in the West was enjoying a period of comparative repose before undertaking an autumnal general forward movement, Field Marshal von Hindenburg launched a tremendous offensive against the Russians in Poland. "Von

Hindenburg's drive," as the movement was popularly called, was the mightiest effort yet put forth in any theatre of war. Its aim was obviously (1) to push the Russians back to a safe distance from Galicia and East Prussia, (2) to conquer Russian Poland, which the Teutonic coalition desired for military, economic, and political reasons, and (3) either to shatter the Russian field army completely, or to drive it back in a badly battered condition to a disadvantageous strategic position, where it would be forced to remain inactive throughout the coming winter. A much clearer conception of the whole situation in the East will be gained if the reader will examine the Russian railway system, as shown on the map on page 715. Warsaw, the capital of Russian Poland, forms the western apex of a westward-pointing wedge of railways. The northern face of the wedge is the all-important line running southwest from Petrograd through Dvinsk, Vilna, Grodno, and Bialystok to Warsaw. The southern face is the main line running southeast from Warsaw through Lublin, Chelm, Kovel, and Kiev to Rostov. Branches of this southern line link up Warsaw with the Black Sea port of Odessa. Between the northern and southern faces of the wedge were two important lines connecting Moscow directly with Brest-Litovsk and indirectly with Warsaw: the more northerly route from Brest-Litovsk to Moscow passed through Baranovitchi, Minsk, and Smolensk; the other route reached Moscow by way of Pinsk, Gomel, and Kaluga. Warsaw and the railway junctions immediately east of Warsaw thus formed the western point, of convergence of the Russian railway salient. The importance of defending Warsaw was fully realized by the Russian General Staff. Not only was the city itself formidably fortified, but on the north a line of fortresses—Novo Georgievsk, Pultusk, Ostrolenka, Lomza and Ossowietz—made the natural line of the Narew River a still stronger protection against a flank attack; while to the southeast the broad line of the Vistula with its fortifications at Warsaw and at Ivangorod was deemed sufficiently strong to repel a flanking attack from the southwest. If the Warsaw angle of forts were lost, the Russian armies could still fall back to the line Kovno-Grodno-Bialystok—Brest-Litovsk-Chelm-Sokal, with the Niemen River to strengthen their right wing and the upper Bug to support their left. Once that secondary line of defenses gave way, the Russian right would be thrust back to Riga and Dvinsk on the Dvina River; the centre would flounder about in the vast marshes of the Pripet around Pinsk; the left wing would rest on the fortress-triangle of Lutsk-Rovno-Dubno, but would be virtually separated from the northern armies by the Pripet swamps. There would be no convenient north-and-south railways to facilitate the shifting of troops from point to point along the line to meet unexpected attacks. In a word, the loss of the apex of the railway salient would put the Russian armies at a serious disadvantage. This was precisely von Hindenburg's object. The "drive" may well be divided into three phases. During the first phase, the Russians were forced to abandon the Warsaw angle of forts at the tip of the salient; during the second phase the secondary line from Kovno through Grodno-Bialystok and Brest-Litovsk was lost; during the third and final phase of this

famous drive the Russian line was pressed back to the Riga-Dvinsk-Pripet Marshes-Rovno position.

THE FIRST PHASE. At the end of June, just after the fall of Lemberg (June 22nd), the Russian armies were still in complete possession of the railway salient, their line stretching from Windau on the Baltic Sea southward in front of Shavli, Kovno, and Grodno; bending westward through Ossowietz, Lomza, Ostrolenka, and Przasnysz; curving southward again in front of Pultusk, Novo Georgievsk, and Warsaw; sweeping southeast through Radom; and passing considerably south of Krasnik, Sokal, Brody, and Tarnopol. During the last week of June and the first two weeks of July the extreme southern tip of the Russian left wing in Galicia was pushed back from Halicz to the northeastern banks of the Złota Lipa and Dniester rivers. During the same period, von Mackensen and Archduke Joseph turned northward from Galicia and captured Zamosc and Krasnik, respectively, where they were within striking distance of Lublin and Cholm, on the southernmost of the sheaf of railways converging on Warsaw. At the same time preliminary actions were begun at various points along the German front. The great offensive opened, all along the line, on July 14th. On that day the main blow was delivered by General von Gallwitz against the Warsaw angle of forts; having captured the town of Przasnysz, he assailed and partially pierced the line of the Narew River near Pultusk. Simultaneously von Mackensen captured the town of Krasnostov, July 16-18, and advanced to within 10 miles of the railway at Cholm. Archduke Joseph, just west of von Mackensen, threatened Lublin, on the same railway, from the direction of Krasnik. Still further west, General von Woyrsch took Radom, and drove the Russians back on their fortress of Ivangorod. While these three armies were menacing the southern face of the Russian railway salient, Generals von Gallwitz, von Scholtz, and von Eichorn were pressing against the northern face, from Novo Georgievsk to Kovno. In the extreme north, General von Buelow captured Tukkum and Windau, July 20th, and advanced toward Riga. These simultaneous attacks on the northern and southern faces of the railway salient rendered the position of the Russian centre at Warsaw extremely precarious. At any moment von Mackensen might cut the southern railway at Cholm and von Gallwitz or von Scholtz might cut the northern railway between Warsaw and Grodno; from the north and from the south the Teutonic armies would bite into the salient behind Warsaw, and the Russian army of the centre would be caught between the jaws of the great German offensive. Grand Duke Nicholas, realizing this peril, chose to sacrifice Warsaw rather than expose his central armies to almost certain disaster. The wisdom of the decision was demonstrated when von Woyrsch forced the passage of the Vistula between Warsaw and Ivangorod, July 28th, and when on the next day von Mackensen cut the Warsaw-Kiev railway between Lublin and Cholm. With feverish haste the Russians transported their guns and stores from Warsaw eastward to safety. During the night of August 4th the Russian army evacuated Warsaw, blowing up the Vistula bridges to prevent pursuit. The German cavalry triumphantly entered the

city on the morning of August 5th, with Prince Leopold of Bavaria in command.

THE SECOND PHASE. The fall of Warsaw marked the success of the first phase of the great Teutonic drive; within three weeks the Russians had been forced to abandon their strongly fortified position around Warsaw. An isolated army at Novo Georgievsk held out for a fortnight longer; but the main body of the Russian centre during the second week of August raced back madly towards the secondary line of defense. For a time it seemed as though a large part of the Russian army would be entrapped. But the stubborn defense of Ossowietz protected the northern flank of the retreating Russian centre, and the secondary line, from Kovno through Grodno, and Bialystok to Brest-Litovsk, was safely reached. The second phase of von Hindenburg's campaign was directed against this line. The line was forced on August 17th at both ends. In the north, the Russian fortress of Kovno, inadequately prepared for attack, was surrendered by a Russian general who later was brought up on charges of criminal neglect of duty. In the south, on the same day, the line was turned by von Mackensen's advance east of Cholm towards Kovel. Ossowietz fell five days later; Bialystok and Brest-Litovsk, on August 25th; and Olita on August 26th. By the end of August, Grodno alone remained of the Russian secondary line. The third phase of von Hindenburg's thrust had begun.

THE THIRD PHASE. The third phase of von Hindenburg's drive lasted through the greater part of September. Its aim was to thrust the battered Russian line—since May 2nd the Russians had lost 300,000 killed and wounded, and 1,100,000 prisoners—back on the Riga-Dvinsk-Minsk-Pinsk-Rovno line and, if possible, to envelop part of the right wing while the centre floundered about in the Pripet Marshes. During this phase of the battle, the Russians offered more stubborn resistance, possibly because the cautious Russian generalissimo, Grand Duke Nicholas, had been removed to the Caucasus, September 8th, and Czar Nicholas, with General Alexeiev as his chief of staff, was determined to sacrifice no more Russian territory. On September 1st the Russian line was being pressed back on Riga in the extreme north; it was still more than 20 miles west of Dvinsk and Vilna, and shielded the transverse railway from Riga through Dvinsk and Vilna to Grodno; south of Grodno the line bent back east of Bialystok, Brest-Litovsk, Kovel, and Vladimir Volinski; the right wing rested on the fortress triangle of Lutsk-Rovno-Dubno. During the month of September the Russian right wing was pushed back from Lutsk, September 1st, and Dubno, September 10th, in spite of successful Russian counterattacks further south near Tarnopol, in Galicia. The Russian centre lost the fortress of Grodno, September 2nd, and fell back east of Pinsk and Baranovitchi (the railway junction just east of Slonim). In the extreme north, Riga was gravely menaced by General von Beseler, whose troops had stormed the bridgehead at Friedrichstadt and were attempting to envelop Riga from the southeast. But the central feature of the September fighting was the battle of Vilna. The important railway junction of Vilna was defended by the Russians with imprudent valor. For while the Russian army west of Vilna was holding in check the German

advance from Kovno, other German armies were striking at Vilna's communications. German troops from the direction of Grodno were attacking Lida. North of Vilna German troops cut the railway at Svientsiany, September 13th, and cavalry swept southeast to Smorgon and



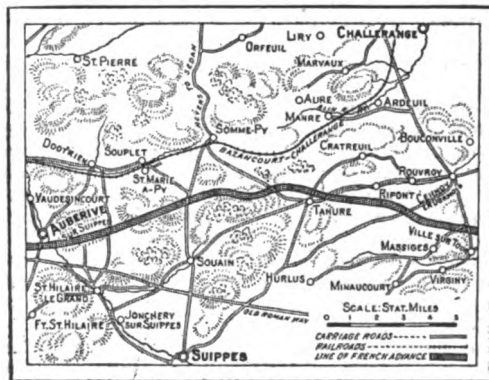
THE RUSSIAN BATTLE-LINE AFTER VON HINDENBURG'S DRIVE

Molodetchna, behind Vilna. The Russians still delayed; but finally on September 18th, they evacuated Vilna. A delay of one or two days more might have resulted in the capture of the entire Vilna army. As it was, the Russians extricated themselves with the greatest difficulty, while fighting brilliant holding battles to safeguard their retreat against the German army attacking from Grodno, which had captured Lida, September 19th, and against the northern flanking force which had struck towards Vileika, Smorgon, and Molodetchna. By October 1st the German drive had come to a standstill, and the Russian armies rested from their retreat: the right wing strongly holding the Dvina River from Riga to Dvinsk, and the lake region from Dvinsk through Vidzy, and Postavy to Smorgon; the centre holding an almost straight north-and-south line from Smorgon to Lipsk, and a zig-zag line through the marshes east of Pinsk; the right fighting for possession of the Lustk-Dubno-Rovno fortress triangle, and annoying the Austrians near Tarnopol.

(11) *The Anglo-French Forward Movement in France: September-October.*

Just as von Hindenburg's drive against Russia was completed, the Allies began a general forward movement in France. Throughout July and August they had been husbanding their resources of men and munitions in preparation for the great effort. In September the renewed activity of Allied aviators and the furious bombardment of the German lines in France indicated that the Allies were about to strike. The

attack began on September 25th. While unimportant assaults were delivered at Hooze (near Ypres), and at other points along the line, the main force of forward movement was concentrated at two points, the first in Artois just north of Arras, the second in Champagne midway between Reims and Verdun. In the Artois region, the initial attack on September 25th and 26th met with brilliant success. The French Tenth Army, north of Arras, captured Souchez, September 26th, and reached Hill 140, and the ridge dominating the town of Vimy. Sir John French, coöperating in the Artois attack, reported that "On the morning of the 25th inst., the First and Fourth (British) Corps attacked and carried the enemy's first and most powerful line of intrenchments, extending from our extreme right flank at Grenay (just west of Lens) to a point north of the Hohenzollern redoubt—a distance of 6500 yards. The position was exceptionally strong, consisting of a double line, which included some large redoubts, and a network of trenches and bomb-proof shelters. Dugouts were constructed at short intervals all along the line, some of them being large caves 30 feet below the ground. The Eleventh Corps, in general reserve, and the Third Cavalry Division were subsequently thrown into the fight, and finally the Twenty-eighth Division." British troops occupied the village of Loos and the outskirts of Hulluck between Lens and La Bassée. "The enemy's second line posts were taken, the commanding position known as 'Hill 70' in advance [east] of Loos was finally captured, and a strong line was established and consolidated in close proximity to the German third and last line." Meanwhile, in Champagne, according to a French report dated October 3rd, the French during September 26th and 27th "succeeded north of Souain and Perthes in occupying a front facing north, and in contact with the German second line along a stretch of seven and a half miles. The ground thus conquered represented an area of some 15½ square miles, and was traversed by lines of trenches graduated to a great depth. The borders of the woods were organized for de-



THE FRENCH ADVANCE IN CHAMPAGNE

fense, and innumerable subterranean passages, trenches, and parallels facilitated resistance foot by foot." After the shock of the initial attack, however, the French and British in Champagne, and in Artois failed to press on, as popular critics expected, to capture the German railway

connections at Lens in Artois, and at Somme-Py in Champagne. In Champagne, to be sure, the French captured the village of Tahure, October 6th, and further slight gains were made in Artois, but the whole movement reached a standstill by the middle of October, without having accomplished any important result, beyond straightening and slightly advancing the Allies' lines. Bitter criticism was heard in England. Disappointment was expressed in France. In Germany the Allied forward movement was regarded as a costly failure, and a clear proof of the ability of the Germans, with their superior technique, to hold the lines in France against numerical odds. A Berlin report estimated the French casualties at 130,000; the British, 60,000; the German, less than 40,000.

(12) *The Diplomatic Failure in the Balkans.*

The months of August, September, and October were discouraging for the Allies. In August and September Russia had been badly defeated; in September and October the great Anglo-French forward movement in the West had begun brilliantly and ended disappointingly; in October yet another misfortune befell the Allies—Bulgaria joined the Teutonic Powers and Serbia was crushed by a combined Teutonic and Bulgarian invasion. In order that the reasons for this disaster may appear more clearly, it is necessary to review the principal elements which stultified the Entente's diplomacy in the Balkans and prepared the way for Serbia's downfall. (1) In the first place, the diplomats of the Quadruple Entente, misled by a mistaken notion that by tactful compromises the ambitions of all the Balkan states (and Russia) could be satisfied, essayed to reconcile Bulgaria with Serbia, Greece, and Rumania, and to bring about the joint intervention of the three neutral states—Bulgaria, Greece, and Rumania. To this end, the Entente urged Serbia to cede Macedonia, and Greece to cede Kavala, Seres, and Drama to Bulgaria. Serbia, however, after long negotiations, was only willing to give partial satisfaction to Bulgaria's Macedonian aspirations; as for Greece, Premier Venizelos was willing (see GREECE), but King Constantine refused. While the Entente Powers were still endeavoring to obtain concessions for Bulgaria from Serbia and Greece, the Bulgarian government was successfully negotiating with The Porte for the cession of the Dedegatch Railway (see BULGARIA), and with the Teutonic Powers for the partition of Serbia. In July, according to apparently authentic reports, a military convention was signed between Bulgaria, Germany, Austria-Hungary, and Turkey. In August the cession of the Dedegatch Railway was arranged. Still the Entente Powers persisted, after all hope had vanished, in their negotiations to patch up the Balkan alliance. The other Balkan states were offended at the partiality shown to their bitter enemy and rival, Bulgaria. In both Greece and Rumania popular sentiment at the beginning of the year strongly favored the Entente, but both Greece and Rumania remained neutral throughout the year, while Bulgaria joined the Turco-Teutonic coalition. By attempting to win *all* the Balkan states to its side, the Entente lost all. (2) A second potent factor in defeating the Entente's Balkan diplomacy was the apprehension frankly expressed in the

Balkan countries in respect of Russia's ambition to take Constantinople for herself; Greek patriots had long cherished the hope that the historic capital of the Byzantine Empire might ultimately become a Greek city; and Balkan sentiment generally was opposed to the establishment of Russian power at Constantinople and Russian hegemony in the Near East. The candid avowal by Russian statesmen of this ambition was, therefore, a serious obstacle to the Entente's diplomatic success in the Balkans. (3) A third difficulty was discovered in the conflict between the territorial ambitions of Greece, Serbia, and Italy. Because Italy aspired to dominate the Dalmatian coast of the Adriatic, Serbia was compelled to modify her ambitions in that quarter. Between Greece and Italy the conflict was more serious. The *Athena*, the chief organ of the Greek ministry, in discussing Italy's intervention in the war, openly confessed the fear that as the Entente Powers had been willing to urge the sacrifice of Greek and Serbian interests to Bulgaria, they had also probably promised Italy Albania, part of which Greece desired, the Dodecanessus, which Italy had occupied since the Turco-Italian war despite Greek remonstrances, and parts of the coast of Asia Minor, which Greece regarded as racially and historically Hellenic. (4) A fourth obstacle was Bessarabia. While Rumania might be tempted to attack Austria-Hungary by the hope of "emancipating" the 3,500,000 Rumanians in Transylvania and Bukovina, she might also be tempted by the Teutonic Powers to attack Russia for the purpose of regaining the province of Bessarabia, more exclusively Rumanian in language and far more fertile than Transylvania. (5) Finally, German-trained military authorities in the Balkan states were firmly convinced of the invincible superiority of the German army. Ferdinand of Bulgaria shared in this conviction. Constantine of Greece had expressed his glowing admiration for German military methods after the Balkan War. Constantine's wife, Sophia, a sister of the German Emperor, was constantly the recipient, during 1915, of messages from Germany describing great German victories. During the summer, moreover, the Balkan nations were duly impressed by the contrast between the magnificent success of von Mackensen against the Russians (*supra*) and the feeble Anglo-French attack on Gallipoli. The manner in which the Greeks regarded the futile Gallipoli campaign may be inferred from the statement which the Greek premier and foreign minister made in December, that Greece had warned the Allies of the difficulty of their plan of campaign, and that "the Greek General Staff long ago had worked out a perfect scheme of operation to be utilized in the event of war between ourselves [Greece] and Turkey." "We still believe," M. Skouloudis concluded, "you [the Allies] would have succeeded if you had been wise enough to adopt it." In the light of these five factors, the decision of Bulgaria to join the Turco-Teutonic coalition, and the refusal of Greece and Rumania to assist the Entente Allies, will perhaps appear less surprising.

(13) *The Conquest of Serbia: October–November.*

The decree mobilizing the Bulgarian army, September 23rd, and the publication of a gov-

ernmental manifesto explaining why Bulgaria should join the Teutonic Powers revealed Bulgaria's decision to attack Serbia. When Bulgaria finally entered the war, October 14th, and began the invasion of Serbia from the east, the conquest of Serbia had already been begun by a group of German and Austro-Hungarian armies under the general direction of Field Marshal von Mackensen. The field marshal's strategy was simple and effective. While the main Austro-German army under Generals von Keovess and von Gallwitz smashed its way through the entrenched Serbian position on the southern banks of the Danube and Save rivers, another Teutonic army would cross the Drina River and strike eastward in the direction of Ushitze, Kralievo, and Krushevats, and the Bulgarians would advance from the east against Nish. Outnumbered and almost surrounded, the Serbian army—then about 300,000 strong, reorganized, and equipped with French artillery—would be easily crushed and probably annihilated. In pursuance of this scheme, Austro-German troops were thrown across the Danube and Save rivers, October 6th; Belgrade fell on October 8th; Semendria, October 11th; and Pozharevats, October 14th. The main body of the Austro-German army of invasion could then sweep irresistibly southward from the Danube up the Morava valley. In the meantime, an Austrian army had invaded Serbia from the direction of Sarajevo and Vishegrad, and was approaching Ushitze. Such was the situation when Bulgaria declared war. The centre of the Bulgarian attack was directed against Nish, the Serbian war-capital. The city was cut off from the south by a Bulgarian army at Vranja, October 17th. On November 5th Nish surrendered. The right wing of the Bulgarian army crossed the Timok River, captured Prahovo and Negotin, and effected a junction with the Teutonic left wing at Liubichevatz, in the extreme northeastern corner of Serbia, October 26th. The left wing of the Bulgarian army was thrown into Southern Serbia by way of Egri Palanka, October 17th, Kumanova, October 21st, and Uskub, October 22nd. The knowledge that an Anglo-French expeditionary force, which had been landed at Saloniki on October 5th, was advancing up the Vardar River with the object of flanking the Bulgarian right, gave the Serbian armies in the south renewed courage to contest fiercely for the possession of Veles* (situated on the railway southeast of Uskub) and to make a desperate stand at Babuna Pass, between Veles and Prilip. The Anglo-French force was held in check (*infra*), however; Veles was captured; Babuna Pass was abandoned; and Prilip and Krushevo were occupied by Bulgarian troops. Meanwhile the Austro-German armies of invasion had driven the shattered Serbian armies of the Danube and Save back up the Morava valley in a retreat which might well have been called a rout. Kragujevats, the principal Serbian arsenal, was captured on November 1st. Parachin, southeast of Kragujevats and more than half way from Belgrade to Nish, was reached by the Teutonic invaders on November 4th. Krushevats fell three days later. During the second half of November the remnants of the Serbian army (exclusive of the small forces in the extreme south) were swept together in

the plain of Kossovo, by the converging Austrian, German, and Bulgarian columns; thousands were captured, but a few escaped across the frontier into Montenegro and Albania. Novibazar was occupied by the victors, November 20th; Mitrovitza and Prishtina, November 23rd; Prizren, November 30th. By the end of November all of Serbia except a narrow strip in the south had been conquered. The German military headquarters signalized the virtual completion of the conquest of Serbia by announcing, November 28th, that "with the flight of the scanty remnants of the Serbian army into the Albanian mountains our main operations are closed." The political significance of Field Marshal von Mackensen's achievement was obvious: it still further increased the respect of Greece and Rumania for German military prowess. The military result of the campaign was the opening up of the railway route "from Berlin to Constantinople," through Nish and Sofia, enabling the Teutonic Powers to supply Turkey with munitions to defeat the Anglo-French force on Gallipoli and perhaps to undertake ambitious offensive operations against Egypt. Nor must the economic aspect of the victory be ignored: not only were the copper mines of Serbia placed at Germany's disposal, but the resources of the Balkan peninsula and of the Turkish Empire in Asia could now be freely drawn upon to replenish the supply of foodstuffs and of minerals in the Central Empires, and, on the other hand, a foreign market was at last procured, despite England's control of the seas, for overstocked German manufacturers.

(14) *The Battle of the Vardar: December.*

It remained for the Bulgarians to complete the conquest of Serbia by expelling the Serbians from Monastir and by defeating the Anglo-French troops on the Vardar. The former object was easily accomplished and the Serbians were driven in defeat from Monastir across the frontier into Albania. The presence of 97,000 French and 75,000 British troops in the Vardar valley was a more serious matter. The Allied force, it will be recalled, had been landed at Saloniki in October and had advanced up the Vardar River towards Veles (Koprili) to turn the Bulgarian right wing. The force was too weak, however, to do much more than to hold its own on a triangle of Serbian territory, the base of the triangle being the Serbo-Greek frontier; the western leg was the line of the Tchernia River, held by the French troops under General Sarrail; the apex of the triangle was at the confluence of the Tchernia and the Vardar; the eastern leg was a line from Gradsko and Krivolak on the Vardar to Lake Doiran, near the angle of the Greek, Serbian, and Bulgarian frontiers. The battle of the Vardar, from December 3rd to December 12th, was simply a series of sledge-hammer blows delivered against the sides of the Anglo-French triangle. During the course of the battle the French line was withdrawn from the Tchernia to the eastern bank of the Vardar, the apex was drawn back from Krivolak to Demir-Kapu, the British line was battered in, and the whole Anglo-French force finally pushed back into Greek territory. The attempt of the Allies to relieve Serbia had ended in ignominious failure. No other result could have been expected from the dispatch of so small

* Another name for Koprili.

a force. Yet the importance of preventing the Germans from conquering the road through Serbia to Constantinople surely would have warranted a more vigorous effort. No feature of the Allies' conduct of the war was so bitterly criticised as this miserable compromise between really relieving and heartlessly abandoning Serbia. In this connection it should be noted that Sir Edward Carson and Mr. Winston Churchill in Great Britain (see GREAT BRITAIN) and M. Delcassé in France (see FRANCE) resigned their ministerial posts rather than share in the responsibility of sending a pitifully weak expeditionary force to certain failure in Serbia.

(15) *The Allies in Saloniki: December.*

That the battle of the Vardar ended in defeat and not disaster was due to the willingness of the Franco-British forces, and the inability of the Bulgarians, to cross the Serbo-Greek frontier, violating Greek neutrality. While the Bulgarians stopped short at the frontier, the Allies retreated through Greek territory to the Greek city of Saloniki, which they proceeded forthwith to fortify, in expectation of a Teutonic-Bulgarian attack. The Greek government, as might have been expected, protested against this abuse of her "benevolent neutrality" by the Allies. The Entente Powers, however, replied that their troops had been sent to Saloniki in the first place at the invitation of M. Venizelos to assist Greece in fulfilling the terms of the secret Serbo-Greek defensive alliance against Bulgaria. This interpretation of the Serbo-Greek alliance was confirmed by M. Venizelos, who exhorted his countrymen not to be false to their ally. King Constantine, on the other hand, held that the treaty contemplated only a local Balkan conflict, and did not bind Greece to sacrifice herself in a general European war. While Hellenic treaty obligations remained in dispute, and neutral observers wondered whether the "benevolent neutrality" of Greece was being stretched or violated, the Allies continued their work of making Saloniki impregnable.

(16) *Montenegro and Albania: December.*

After Serbia, it was the turn of Montenegro and Albania to suffer invasion. Reinforced by Serbian refugees, the small but resolute Montenegrin army valiantly opposed the Teutonic invasion, but in vain. During December Teutonic columns penetrated Montenegro from the north, from the east, and from the southeast, capturing Plevlie, Ipek, and Djakowa, and threatening to make short work of the little mountain kingdom. The Albanian tribesmen, lacking organization and equipment, offered little resistance, either to the Serbian troops which had been driven across the Albanian frontier, or to the Austro-Germans and Bulgarians who followed. The numbers of the Serbians in Albania were variously estimated from 50,000 to 220,000. Whatever the strength of the Serbian force in Albania may have been, at any rate the Bulgarians experienced little difficulty in penetrating into the heart of the principality from the direction of Ochrida, Struga, and Dibra. (For details regarding the political status and previous condition of Albania, see ALBANIA, *History*.)

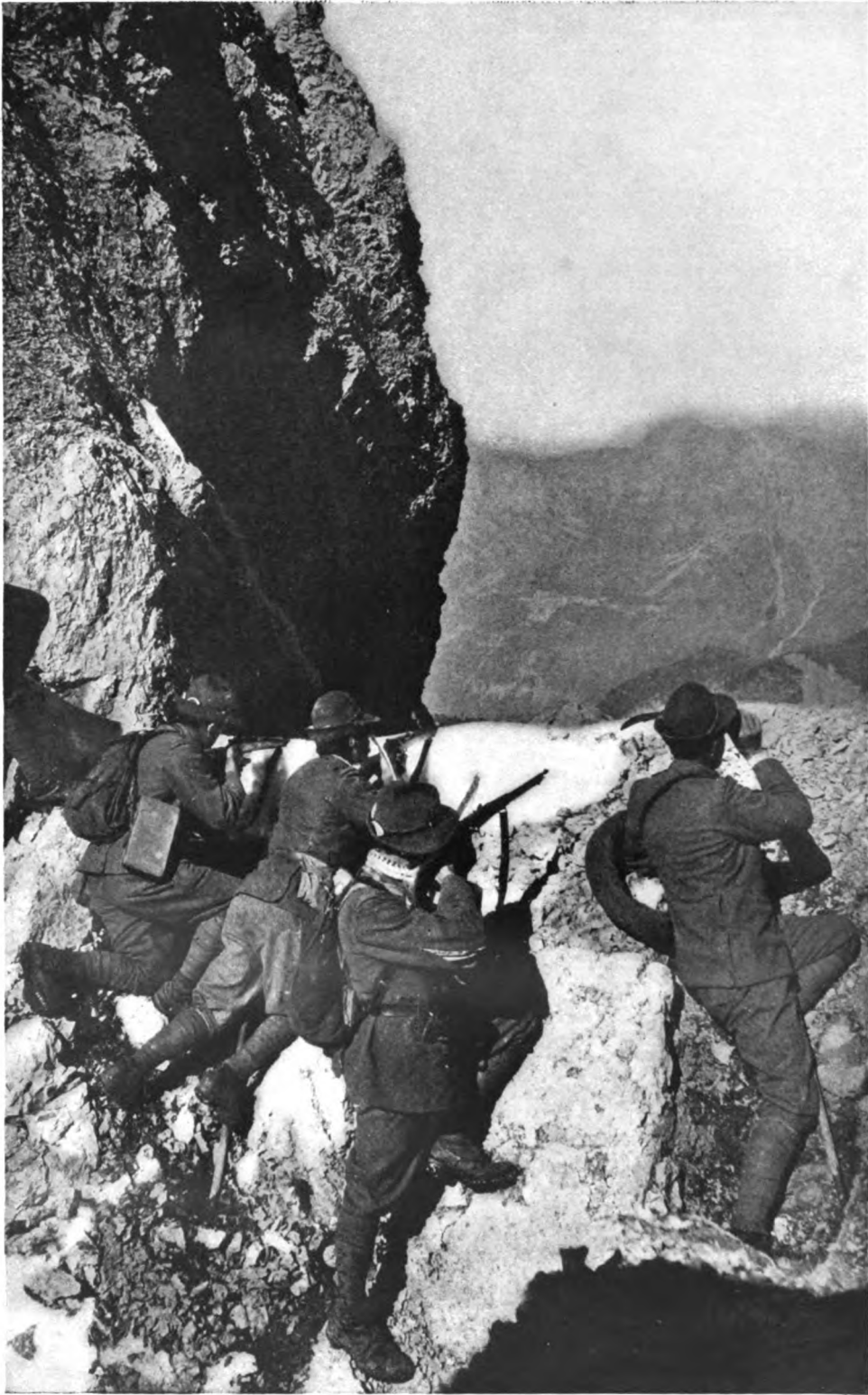
(17) *Italy's Achievement: June-December.*

The plan of Italy's campaign against Austria-Hungary has already been indicated in a previous paragraph; the achievement of the Italian army, in the seven months from May 24th to December 31st, remains to be stated. Against the mountainous eastern and central sectors of the Austrian frontier, almost no progress was made. The Italian operations in these regions, conducted under the greatest topographical difficulties, were calculated simply to protect Lombardy from a possible Austrian counter-invasion. Against the Isonzo line the main efforts of the Italian general staff were directed. The northern end of the line was forced early in the



ITALIAN CAMPAIGN AGAINST GORIZIA (GORIZIA)

summer, when the peak of Monte Nero was successfully stormed by Italian infantry. Between Monte Nero and Gorizia, the Isonzo line was pierced near Plava and at Tolmino. South of Gorizia the Isonzo line was likewise crossed in the early summer, and the towns of Monfalcone and Gradisca captured, June 9-10. The Austrian positions around Gorizia, however, defied capture. The frontal attack on Gorizia was halted at the bridgeheads on the Isonzo by the withering fire of advantageously placed Austrian batteries. Enveloping movements from Plava, on the north, and from Gradisca against the Carso Plateau on the south, encountered fierce resistance and were checked with severe losses. Heavy Italian guns rained high-explosive shells on the town of Gorizia and on the Austrian positions on the heights beyond; but apparently



ITALIAN ALPINE TROOPS DEFENDING A MOUNTAIN PASS

with no effect. To sum up the Italian achievement: Italian territory had been protected from invasion; a few Austrian border towns had been pulverized, and a few towns * of "Italia Irredenta" had been "redeemed"—or laid in ruins; but the main Austrian defensive positions in the Trentino and behind Gorizia repelled every assault. According to an Italian estimate this achievement had cost Italy 45,000 men. Italy's service to her Allies, it may be remarked, was greater than her progress towards the realization of her own national interests: Italy's intervention had stopped one more channel through which supplies could leak into Germany and Austria-Hungary; her fleet had been a welcome addition to the Allies' naval superiority; and her armies had occupied the attention of somewhere between 500,000 and 1,000,000 Austro-Hungarian soldiers. Throughout the later months of the year, rumors frequently asserted that Italy had sent an expeditionary force to Gallipoli, or to the Dardanelles, or to the Balkans. As far as could be ascertained at the close of the year, however, Italy's only expeditionary force, and that a small one, was sent to occupy Avlona and other points along the coast of Albania.

(18) Failure on Gallipoli: June-December.

One of the keenest disappointments suffered by the Allies in 1915 was the failure of the Dardanelles campaign. By the middle of June, as an earlier paragraph has explained, the main Anglo-French land attack on the tip of Gallipoli Peninsula had apparently subsided into a deadlock. On June 21st slight gains were made on the right of this line, commanding Kereves Dere; a week later the British lines were advanced on the left, in Saghir Dere, and terrific Turkish counter-attacks were repulsed with heavy losses. Battles of this nature, in which a few hundred yards of trenches were gained or lost, continued to be reported at intervals during the autumn and winter, but the main Turkish position in the tip of the peninsula, Achi Baba Peak, was not even seriously menaced. Despairing of success in this region, Gen. Sir Ian Hamilton decided to exert a powerful effort from the secondary British landing (Anzac Cove). If the hill (971 feet) called Sari Bair, back of Anzac Cove, could be carried by storm, an attack on the northern flank of the Kilid Bahr position might be undertaken with a reasonable probability of success. The great effort was made early in August. While reinforcements were landed north of Sari Bair, at Suvla Bay, the Australasian and Indian troops with reckless gallantry charged up the slopes of the hill. The Gurkhas actually succeeded in reaching the heights on the neck between Chanuk Bahr and "Q" Hill, whence they could look down upon the Dardanelles, but they were compelled to fall back for lack of support. With valor quite equal to that shown by the British colonials, the Turks swept down the slopes, in the face of a murderous artillery and machine-gun fire, to dislodge the British from the footholds which had been gained. On August 10th, at the close of the battle, the British still held some of their gains, but two commanding positions which had been won by daring assaults, had been lost

again to the Turks, and the great effort had failed. In the Sari Bair region, as in the Achi Baba region, trench-battles continued throughout the rest of the year without decisive result. In the trenches on the tip of the peninsula, the Anglo-French troops were decimated by disease; before Sari Bair the British colonials were maddened with thirst in consequence of unpardonable inefficiency in the management of the water supply. More than one of Sir Ian Hamilton's lieutenants were accused of incompetence. Sir Ian himself was recalled in October, and superseded by Gen. Sir Charles C. Monro. Earl Kitchener was sent to investigate the situation. Withdrawal from the peninsula was openly advised by General Monro, frankly discussed by the press, and postponed, it seemed, only by the unwillingness of the British ministry to admit a disheartening defeat just when a supreme effort was being made to stir up popular enthusiasm for recruiting (see GREAT BRITAIN). Towards the end of December the long-expected step was taken, and the British troops were withdrawn from the Suvla Bay and Anzac regions * on the western shore; shortly afterwards, early in January, the trenches on the tip of the peninsula were abandoned, without loss, according to the British report—with heavy losses, according to the Turkish statement. The campaign thus brought to an inglorious close had cost the British, up to December 9th 114,555 men, of whom 26,172 were dead. It is significant that the withdrawal was effected immediately after the conclusion of Lord Derby's recruiting campaign in England (see GREAT BRITAIN). The most telling criticism of the management of the Dardanelles operations, and at the same time the most vigorous apology for the higher strategy which had dictated the inauguration of the campaign, was given by Mr. Winston Spencer Churchill, in his remarkable speech before the House of Commons on November 15th: "It has been proved in this war," he said, "that good troops properly supported by artillery can make a direct advance two or three miles in the face of any defense. The advance, for instance, which took Neuve Chapelle, or Loos, or Souchez, if made on the Gallipoli Peninsula, would have settled the fate of the Turkish army on the promontory, would probably have decided the whole operation, might have determined the attitude of the Balkans, might have cut off Germany from the East, and might have saved Serbia." All through the year, he asserted, he had urged the government to concentrate its offensive efforts on Gallipoli; for in France a costly gain meant only a "nibble," whereas "on the Gallipoli Peninsula, our army has stood all the summer within a few miles of a decisive victory."

(19) The Menace to Egypt.

One of the chief results of the failure of the Anglo-French campaign at the Dardanelles was to release a Turkish army of at least 200,000 men for active service elsewhere. Since an at-

* Grado, Porto Buso, Monfalcone, Gradiaca, Cormon, San Pietro, Plano, Caporetto, Monte Nero, and Plezzo.

* Immediately after the withdrawal of the British colonial troops from the Anzac region of the Gallipoli Peninsula had been accomplished, it was announced that Sir Charles Carmichael Monro had been transferred from the Dardanelles to command the First British Army in France. Lieut.-Gen. Sir Archibald Murray succeeded General Monro in command on Gallipoli, and completed the withdrawal.

tack upon Egypt, menacing an important British possession and threatening England's cherished route through the Suez Canal to India and Australasia, would be one of the most advantageous campaigns in which Turkey's Gallipoli army could be employed, it was not surprising that at the close of the year rumors became frequent that a great Turkish invasion of Egypt was being prepared. In the light of this new situation, the earlier Turkish attack on the Suez Canal assumed new significance and interest. The difficulties of military operations against the Suez Canal were enormous. The attacking forces must drag their artillery and carry their pontoons more than a hundred miles through the desert of the Sinai Peninsula. At the end of their arduous journey, the Turks would find the canal watchfully guarded by warships and by a considerable force of British colonial and Egyptian troops. It was therefore an unpromising and a hazardous mission which Djemal Pasha undertook in the opening months of 1915. During January, 1915, the Turkish commander's army, variously estimated at from 25,000 to 65,000 men, accomplished the difficult feat of crossing the Sinai Peninsula. Advanced guards of the Turkish army were encountered and driven back by the British defenders of the canal as early as January 25th. The main Turkish columns, however, did not come up until a week later. While feint attacks were delivered, February 2nd, against El Kantara and Ismailia, the strongest column of Djemal Pasha's army was directed against the section of the canal between Tussum and Serapeum, south of Ismailia. During the night of February 2-3, the Turks dragged their pontoons and rafts to the water's edge and began to construct a pontoon bridge across the canal. They were discovered by the British troops on the western embankment, and about 3 A. M. the battle began in earnest. Under the murderous fire of the British Maxims, the Turks attempted to cross the canal in boats or rafts. One boatload actually succeeded in reaching the western bank, and attacked the British from the rear. Six batteries of field artillery were brought up by the Turks during the course of the morning of February 3rd. The British defenders, however, with the aid of torpedo-boats and gunboats, frustrated the attempt to bridge the canal and in the middle of the afternoon the Turks turned and fled, leaving 500 men killed and 600 prisoners. The main Turkish force, however, made good its retreat. A month and a half later, a body of Turkish troops, about 1000 strong, was encountered near Suez and driven back towards Nakhil. With this skirmish, the first Turkish attack on Egypt may be said to have ended. Djemal Pasha's force had been too small, and the expedition had been too feebly equipped, to constitute a serious menace to the canal; at the close of the year 1915, however, the Turks had available a larger army than Djemal Pasha's; they were receiving munitions from Germany by way of conquered Serbia; and German engineers might expedite the crossing of the Sinai Peninsula by constructing military railways through the desert. Whether under these more favorable circumstances Enver Pasha would again send a Turkish army to invade Egypt remained one of the most interesting questions for the year 1916 to answer.

The Suez Canal route to India was menaced from yet another direction by Arab assaults

upon the British fortress of Aden, at the southern gateway to the Red Sea. Late in December the British India Office published the following statement regarding this attack: "The statement that the Turks have had far-reaching military successes at Aden is a complete misapprehension. In July last the Turks, having occupied Lahej, advanced to Sheikh Othman, in the neighborhood of Aden, and looted it. They were, however, driven out, and withdrew inland and have not ventured to advance again on the fortress of Aden. Such skirmishes as there have been during the last three months resulted favorably to us; but there has been no material change in the situation during that period. . . . So far as the security of the Suez Canal route to India is concerned, the present situation at Aden may be left out of account." Egypt, it should be mentioned, was attacked from the west in December by comparatively small bodies of Senussi tribesmen from the Libyan frontier.

(20) *The British in Mesopotamia.*

Before Enver Pasha, the ambitious Turkish minister of war, undertook a new offensive campaign against Egypt, it seemed probable that he would send reinforcements to the Turkish troops resisting British and Russian aggression in Mesopotamia, Armenia, and Persia. Up to the end of 1915 the campaigns in these regions were of distinctly secondary importance. The force originally sent by the British from India to Shat-el-Arab (at the head of the Persian Gulf) included only three Indian regiments and had, as far as could be discerned at the time, no other important object than the protection of the Anglo-Persian Oil Company's pipe-line, near Basra. The Turkish garrison of Basra, advancing to repel the British, was crushingly defeated, Nov. 17, 1914, and Basra was occupied by the British. The British then advanced to Kurna, at the confluence of the Tigris and Euphrates rivers. The Turkish forces in Mesopotamia, however, would not permit the British to remain at rest in the entrenched camp at Kurna. In April, 1915, the British were compelled to meet the Turks in a pitched battle at Shaiba; according to British reports the Turks left 6000 of their men on the field, besides valuable supplies, machine-guns, automobiles, and ammunition. At the end of May the British, again assailed, pursued a Turkish force up the Tigris to Amara (75 miles north of Kurna). Flushed with success, the British were drawn further and further northward, until on September 28th Maj.-Gen. C. V. F. Townshend defeated the Turks before Kut-el-Amara and occupied the city the following day. With insignificant forces the British had penetrated more than 200 miles into Mesopotamia (346 miles by water). Bagdad, only 100 miles further up the Tigris (227 following the course of the river), lured the invaders on. Gen. Sir John Nixon, the commander in charge of the expedition, sent Major-General Townshend on to Bagdad. On November 22nd Major-General Townshend attacked and carried the Turkish defensive positions at Ctesiphon, only 18 miles from Bagdad. Then the tide turned. Townshend, overwhelmed by superior numbers, was defeated with a loss of 4500 out of 20,000 men and driven back to Kut-el-Amara, which was promptly surrounded and invested. A relief expedition, led by General Aylmer, failed

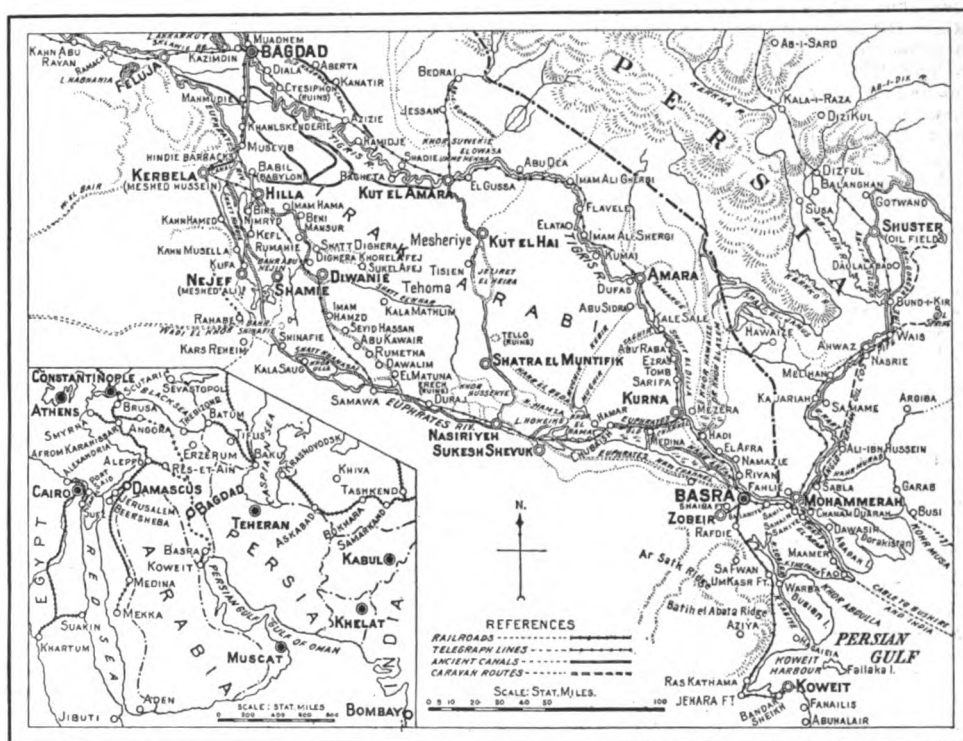
to reach Kut-el-Amara. With Townshend's army menaced at Kut-el-Amara with a fate like that which befell Gordon at Khartoum, the Mesopotamian expedition, at the close of the year, promised to furnish the critics of the British government with a new ground for complaint.

(21) *The Russians in Armenia and Persia.*

In November, 1914, the Turks undertook an ambitious campaign in the Caucasus region. Enver Pasha was present in person, with a staff of German advisers, to superintend the operations. While the Eleventh Turkish army corps in front of Erzerum occupied the attention of the Russian forces, the Ninth and Tenth Turkish corps aimed to encircle the right flank of the

tion, cost the Turks not less than 50,000 men. Pursuing their advantage, the Russians pressed on Khorasan, on the way from Kars to Erzerum, and occupied Van, about 150 miles southeast of Erzerum, May 23rd; but the Turks remained in possession of Erzerum throughout the remainder of the year.

The Russo-Turkish operations in Northwestern Persia were closely connected with the campaign in Turkish Armenia. The repulse of the Turkish armies east of Erzerum in January was followed by the failure of a parallel Turkish campaign against Tabriz, the most important town of Northwestern Persia. Early in January the Turks had occupied Urza and Kotur, and after defeating a Russian army at Mjandoab had advanced east of Lake Urumiah and had captured Tabriz. The Russians, however, were



MESOPOTAMIA AND ITS STRATEGIC POSITION

Russians and cut them off from Kars. The First Turkish army corps was simultaneously to advance from Trebizond against Ardahan (northwest of Kars). The Turkish armies, however, were so exhausted by their forced marches over snow-bound mountain roads, that the Russians were able to defeat them in detail. On Jan. 1, 1915, the Tenth was driven back. The retreat of the Tenth exposed the left flank of the Ninth Turkish corps at Sarikamish, and enabled the Russians to surround and capture the entire corps. On January 3rd the First Turkish corps, which had successfully reached Ardahan, was attacked in turn and driven back in headlong rout. The Eleventh, endeavoring to hold the attention of the Russians, fought stubbornly, but was forced finally to retreat to Erzerum, January 17th. The series of operations, so brilliant in conception and so disastrous in execu-

able at the end of January to bring troops from Kars and to recapture Tabriz. During the spring the Russians gradually reconquered the province of Azerbaijan (a province in Northwestern Persia, practically under Russian control). By the end of May the Russians announced that Urumiah, west of the lake of that name, had been retaken. In November a Russian army was sent against Teheran, the capital of Persia; and the Persian government, under a new "pro-Ally" premier (see PERSIA), fell under the complete domination of the Allied Powers. Hamadan (165 miles southwest of Teheran) and Kum (80 miles south of Teheran), where the mutinous gendarmerie and pro-German rebels had established themselves, were occupied by the Russians in December. From Hamadan the Russians were expected—according to the British press—to march southwest-

ward into Mesopotamia, to relieve General Townshend's beleaguered force at Kut-el-Amara.

(22) *The Russian Army at Bay: October-December.*

The close of the year 1915 found the main Russian army at bay, along a front 700 miles long, from Riga to Bukovina, stubbornly resisting any further encroachments upon the territory of "Holy Russia." Since the cessation of the great Austro-German offensive in September, little of importance had occurred on the Russian front. The Teutonic armies, weakened in order to reinforce the Austro-Hungarian offensive against Serbia (*supra*), were content to rest on the defensive, although von Buelow, on the Teutonic left wing, continued to threaten Riga, and intermittent attacks were delivered against the Russian line west of Dvinsk and at the point where the Kovel-Kiev railway crosses the Styr River. The Russian army—under the command of Czar Nicholas since September 8th—not only held its own in the marshy region before Riga and in the lake-country around Dvinsk, but assumed the offensive in the extreme south. In Galicia General Ivanov's army west of Tarnopol reported a series of successes against the Austro-Hungarians. Further south, in Bukovina, the Russians were striving to recapture Czernowitz. The purpose of the vigorous Russian offensive in Galicia and Bukovina was obvious: it might force the Austro-Hungarians to fall back from Volhynia, and it might bring Rumania into the war.

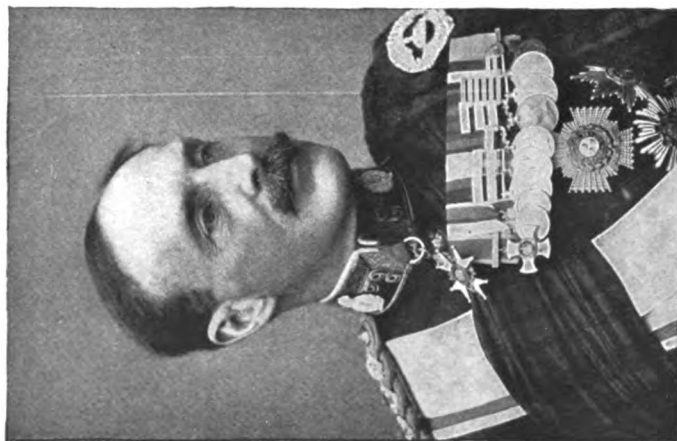
(23) *The Deadlock in France: October-December.*

The Anglo-French forward movement of September-October failed to break the deadlock in the West. From October to the end of the year, the contending armies along the great battle line from Belgium to Alsace devoted themselves more assiduously than ever to the perfection of their intrenchments and fortifications. Trench warfare had become a new science. First, second, and third lines of trenches, connected by zigzag communication trenches or by tunnels, gave shelter to the infantry. Covered shelters, cages, and dugouts, constructed with amazing ingenuity, afforded protection both from shrapnel and from the elements. Attacks on the enemy's trenches must be preceded by a furious bombardment with high-explosive shells, which would blast out of existence the enemy's barbed wire entanglements and first-line trenches. The attacking troops, often wearing gas-proof hoods, and carrying bombs and bayonets, were mowed down by machine-guns and by the fire of field guns such as the French "soixante quinze" (75 mm.). The way for infantry charges, of a small nature, was most frequently prepared by the explosion of a mine underneath the enemy's trenches. Meanwhile the mightier howitzers, concealed several miles behind the first-line trenches, intermittently hurled their tremendously destructive shells against the enemy's position. (Consult article on MILITARY PROGRESS.) In this new art of trench warfare, equipment and ingenuity appeared to be more important than mere numbers. The Germans, who were generally admitted to be outnumbered, were not only able to hold their own, but actually re-

gained some of the ground lost in September and October, notably the position on the Hill (Butte) of Tahure, in Champagne. In Alsace, however, on the slopes of the Vosges Mountains, the methods of siege warfare were not always applicable, and picturesquely garbed mountaineers, gliding swiftly on skis, engaged in less laborious combats. The summit of Hartmannsweilerkopf, in Alsace, was captured by the French in October, according to French reports, recaptured by the Germans, and again won by the French, December 21st. Two other features of the campaign in the West deserve mention. The promotion of General Joffre to the supreme command of *all* the French armies (i.e., including those in the Near East as well as those in the West, but not the troops in the colonies), and the appointment of General de Castelnau as French chief of staff, were shortly followed (December 15th) by the removal of the British commander in chief, Sir John French, and the appointment of Sir Douglas Haig to command the British armies in France and Belgium (see HAIG, SIR DOUGLAS; FRENCH, SIR JOHN). On December 27th the British government announced that the Indian Army Corps, which had hitherto served in France, had left for "another field of action."

(24) *Conquest of the German Colonies.*

While General Joffre's armies in the West, and Czar Nicholas's armies in the East, were unsuccessfully striving to expel the German invader from Belgium, from Northern France, and from Poland, the colonial forces of Great Britain and her Allies were completing the conquest of the German colonies. A considerable part of the German colonial empire had been appropriated by the Allies in 1914: the leased-territory of Kiaochow had been conquered by Japan, Nov. 6, 1914; in the southern Pacific German New Guinea (Kaiser-Wilhelmsland), the Bismarck Archipelago, the German islands in the Samoan group, the Marshall and Solomon Islands, and the Caroline Islands were all occupied by British and British Australasian forces before the end of the year (see YEAR BOOK, 1914). In Africa, Togoland had been captured, August, 1914, by Anglo-French forces; the invasion of German Southwest Africa had been begun in September, 1914; Kamerun had been attacked from the coast, from Nigeria, and from French Congo; and unsuccessful expeditions had been sent against German East Africa. During the year 1915, the conquest of German Southwest Africa was carried to completion by General Botha (see GERMAN SOUTHWEST AFRICA; SOUTH AFRICA) in July, 1915; Kamerun, on the western coast of Africa, was almost conquered; and preparations for a serious invasion of German East Africa were made. By the close of the year, the unexpectedly stubborn defense of Kamerun had been virtually crushed, and most of the colony was in Anglo-French possession (see KAMERUN); German East Africa, however, had suffered little from Allied incursions. Attempted invasions by British troops from British East Africa, along the shores of Victoria Nyanza, had been checked. Mafia Island, however, was in British possession, the coast was under blockade, and the German cruiser *Königsberg* had been destroyed near the mouth of the Rufiji River. In December it was



General SIR DOUGLAS HAIG, K.C.B.



Lieutenant-General SIR CHARLES C. MONRO
THREE BRITISH GENERALS PROMINENT IN 1915



General SIR IAN HAMILTON, G.C.B.

announced that a force of 25,000 men had been raised by the Union of South Africa, thanks to the untiring energy of the Union minister of defence, Gen. Jan Christian Smuts, and Gen. Sir Horace Smith-Dorrien had been brought from France to conduct a formidable attack on German East Africa.

VI. NAVAL OPERATIONS

The supremacy of the British fleet remained throughout the year 1915 a silent but a potent factor, ensuring the transport of troops to and from the Dardanelles, across the British Channel, and from the colonies; it enabled the Allied Powers not only to continue their commerce with neutral nations, but also to make war on German trade; it constituted, in fact, the chief bulwark of British confidence. No serious attempt to question British naval supremacy was made by the German battle fleet. The most important naval engagement fought during the year was the battle of Dogger Bank, Jan. 24, 1915, in which a German battle-cruiser squadron raiding the coast of England was severely punished for its temerity. The German squadron was sighted by Admiral Beatty off Dogger Bank early in the morning of January 24th. Immediately the German battle cruisers turned back towards Heligoland with Admiral Beatty's ships in full pursuit. The three more powerful German battle cruisers (*Moltke*, *Seydlitz*, and *Derfflinger*), screened by the dense smoke of a destroyer flotilla, and assisted by the timely appearance of German submarines, made their escape, although with serious injuries. The antiquated *Blücher*, however, with only 8.2-inch guns to oppose to the British 13.5-inch guns, and considerably slower than the three German dreadnought cruisers, fell an easy victim and was first crippled by gunfire, then torpedoed and sunk. The battle was a conclusive demonstration of the value of big guns and high speed in modern naval warfare. The British battle cruisers engaged, including the *Indomitable*, the *New Zealand*, the *Princess Royal*, the *Lion*, and the *Tiger*, mounted 16 12-inch guns and 24 13.5-inch guns against the 8 12-inch guns, 20 11-inch guns, and 12 8.2-inch guns of the Germans. To their superiority in big guns the British owed their success in sinking the *Blücher* and in damaging the other German cruisers, a success which might have been pressed to a more decisive conclusion, had not German submarines made their appearance and menaced the British pursuers. The battle of Dogger Bank so strongly confirmed the confidence of the British Admiralty that in February a powerful British and French fleet was sent to bombard the Dardanelles forts (*supra*, under *Military Operations, The Dardanelles*). At the Dardanelles, however, the Allied battleships were pitted, not against German cruisers of inferior gun-power, but against land forts, submarines, and floating mines. In the great effort to force the Narrows, March 18th, the British battleships *Irresistible* and *Ocean*, and the French battleship *Bouvet* were sunk; the British *Inflexible* and the French *Gaulois* were disabled; and several other ships were badly battered. Subsequently the British *Goliath* was torpedoed at the Dardanelles on May 12th; the *Triumph* on May 25th; and the *Majestic* on May 27th. Besides the battle of Dogger Bank and the Dardanelles action, the

only naval operations of any importance, involving capital ships, were (1) in the Adriatic, where the Austro-Hungarian navy was held in check by the French, with the assistance of the Italian fleet, after May 24th; (2) in the Baltic, where a German squadron, according to Russian reports, forced its way into the Gulf of Riga and was expelled with the loss of three small cruisers, seven torpedo boats, and the powerful battle cruiser *Moltke*; and (3) in the Black Sea, where, after the Turkish battle cruiser *Sultan Selim* had been injured by a mine, the Russian fleet asserted its superiority, but was held off from Constantinople by submarines and by the fortifications of the Bosphorus. In the absence of any really decisive naval operations, naval critics in Germany and in Great Britain commented much on the cumulative effect of losses and of new construction in increasing or decreasing the disparity between the rival fleets. The Germans tabulated the losses of the British and Allied navies, including the losses at the Dardanelles, as well as the British predreadnought *Formidable* (sunk by torpedo, January 1st), the Italian battleship *Benedetto Brin* (sunk by explosion, September 28th), the Italian cruiser *Amalfi* (sunk by torpedo, July 7th), the *Garibaldi* (sunk by torpedo, July 17th), the British cruiser *Natal* (sunk by explosion, December 30th), and other warships destroyed by mine, torpedo, or accident. The British, on the other hand, maintained that not only were comparable losses being inflicted upon the German fleet, but furthermore the British Admiralty was rushing the construction of new ships, with the result that British naval superiority had been increased since the war began. (For precise information regarding the navies of the belligerent Powers, consult articles on GERMANY, GREAT BRITAIN, etc.)

By all means the most significant aspect of the war on the water was the attempt of Great Britain to realize to the full, and the efforts of Germany to minimize, the economic advantages accruing from British naval superiority. A few German commerce destroyers still remained at large, in January, 1915, preying upon the merchant marine of the Allies. One of the German commerce destroyers, the auxiliary cruiser *Prinz Eitel Friedrich*, slipped into Newport News, Va., March 10th, after a destructive cruise of more than 30,000 miles. The German light cruiser *Dresden* was sunk by British ships on March 14th. The German converted cruiser *Kronprinz Wilhelm*, after sinking nine British, four French, and one Norwegian merchantmen, entered Newport News, April 11th, and was interned. The cruiser *Königsberg*, which had been driven to seek refuge in the Rufiji River on the coast of German East Africa, was attacked by two British river monitors, the *Mersey* and the *Severn*, and was destroyed, in July. The danger from German cruisers and auxiliary cruisers had meanwhile been overshadowed by a new menace to the commerce of the Allies—the submarine. On February 4th the inauguration of a novel form of submarine warfare was announced. The German government declared that it would consider "the waters surrounding Great Britain and Ireland, including the whole English Channel, to be comprised within the seat of war, and will prevent by all the military means at its disposal all navigation by the enemy in those waters. To this end it will endeavor to destroy, after Feb-

ruary 18th next, any merchant vessels of the enemy which present themselves at the seat of war above indicated, although it may not always be possible to avert the dangers which may menace persons and merchandise. Neutral Powers are accordingly forewarned not to continue to entrust their crews, passengers, or merchandise to such vessels. Their attention is furthermore called to the fact that it is of urgency to recommend to their own vessels to steer clear of these waters. It is true that the German navy has received instructions to abstain from all violence against neutral vessels recognizable as such; but in view of the hazards of war, and of the misuse of the neutral flag ordered by the British government, it will not always be possible to prevent a neutral vessel from becoming the victim of an attack intended to be directed against a vessel of the enemy." The cause assigned for this extraordinary innovation in the practice of naval warfare was the disrespect of neutral rights and disregard of international law, particularly of the Declaration of London, evinced by the British government in capturing non-contraband German property on board neutral ships, in apprehending German subjects on neutral ships, in altering the contraband rules, and in declaring the whole North Sea between Scotland and Norway to be a seat of war. The Germans alleged that Great Britain had adopted a ruthless policy of starving the civilian population. The British, on the other hand, declared that since the German government had commandeered foodstuffs (Jan. 25, 1915, see GERMANY), the British navy was quite justified in intercepting food supplies which might be confiscated by the German government for the use of the German army. The United States government endeavored to obtain mutual concessions from the belligerents in the interest of neutral rights, but its proposals were rejected by the British government, and a new British Order in Council, March 15th, having declared a virtual blockade of Germany, the issue was squarely joined between the British blockade and the German submarine. Neutral Powers were adversely affected by the contest, because (1) numerous neutral merchantmen were torpedoed; (2) because several belligerent liners were sunk by German submarines either without warning or without opportunity for safeguarding the lives of the passengers, some of whom were citizens of neutral Powers; (3) because neutral trade with Scandinavian ports and with Holland was interfered with by the British policy of intercepting all goods of German origin or ultimately destined for Germany, even when the goods were carried by neutral ships between neutral ports; (4) because British operations in the North Sea and German submarines in the Channel made navigation hazardous for neutral merchantmen. The intricacies of the controversies which ensued with regard to the rights of neutrals may not be discussed in this article; it is important, however, to indicate at least a few of the salient features of the submarine-blockade contest, in relation to the general issues of the war. (1) The sinking of the Cunard liner *Lusitania* (q.v.), May 7th, without warning, with the loss of 1396 lives, undoubtedly embittered the anti-German sentiments of British and Allied nations, and did much to promote an anti-German agitation in neutral countries. The German government, it

may be noted, laid the responsibility for the *Lusitania* tragedy upon the British government; in a note to the United States, Herr von Jagow stated: "The case of the *Lusitania* shows with horrible clearness to what jeopardizing of human lives the manner of conducting war employed by our adversaries leads. In the most direct contradiction of international law all distinctions between merchantmen and war vessels have been obliterated by the order to British merchantmen to arm themselves and to ram submarines, and the promise of rewards therefor, and neutrals who use merchantmen as travelers thereby have been exposed in an increasing degree to all the dangers of war. If the commander of the German submarine which destroyed the *Lusitania* had caused the crew and passengers to take to the boats before firing a torpedo this would have meant the certain destruction of his own vessel." Notwithstanding this attempted justification, it may safely be asserted that the sinking of the *Lusitania* furnished the Allies with a most powerful recruiting argument and stimulated pro-Ally sentiment in neutral countries. (2) What the German government hoped to gain by its submarine warfare was obvious: the flow of ammunition to Great Britain from neutral countries would be seriously interrupted, British shipping would suffer, and possibly the British government could be compelled to relax its measures against German imports. The submarine campaign was at once a defensive operation to prevent Great Britain from "starving Germany out," and an offensive operation to interfere with Great Britain's munitions supply and commerce. (3) The results of the submarine campaign had not yet been definitely established by the close of the year, but it appeared reasonably certain that in its major objects the campaign had failed, inasmuch as the British government, instead of relaxing, had drawn more tightly the restrictions on German imports through neutral countries; and although very considerable injuries had been inflicted upon the Allied and neutral merchant marines, the flow of munitions to Great Britain and the course of British sea-borne trade had not been seriously disturbed. In the last quarter of the year the statement was quite generally credited that a large proportion of the German submarine flotilla had been destroyed by British trawlers, motor-boats, and aviators, or entrapped in great submarine nets.

VII. AÉRIAL OPERATIONS

The importance of airmen in directing the fire of artillery and in detecting unexpected movements of enemy troops had already been well established by the first few months of the war. During the year 1915 the services of air-scouts to the belligerent armies and navies remained invaluable. The most interesting phase of the aerial operations in 1915, however, was the use of airships and aeroplanes for independent operations. Intense excitement, and a certain amount of genuine concern, were manifested with regard to the possibility of German Zeppelins inflicting serious damage upon London or Paris. Most elaborate precautions were taken to darken the city of London at night; gigantic searchlights and anti-aircraft guns were pointed towards the murky London skies. But after the repetition of comparatively harmless German

air-raids on England—including the Zeppelin raid on London on May 31st, in which six persons were killed, the Zeppelin raid on London of August 17th, in which ten or more persons were killed, and a third Zeppelin attack on London, September 7-8, in which 37 persons were killed—the fear of serious German air raids became less acute. The most serious German raid on London occurred on October 13th and resulted in 169 casualties, of which 55 were fatal. "In reprisal" for the German air raids, the Allies organized frequent counter-raids. On February 16th a fleet of 40 British and French aeroplanes and seaplanes bombarded the German lines in Belgium; in August a powerful flock of 32 "battle planes," larger and stronger than ordinary aeroplanes, dropped bombs on German munitions factories at Saarbrücken; on August 25th a still more ambitious raid was made on Dellingen by 62 Allied 'planes. Less important aerial operations were conducted on other fronts. One of the most interesting single events in the year's war in the air was the duel between a British monoplane and a huge German Zeppelin, on June 7th, which ended in the destruction of the Zeppelin and won the Victoria Cross for the gallant aviator, Lieut. Reginald A. J. Warneford, who was killed 10 days later.

VIII. THE SITUATION AT THE CLOSE OF THE YEAR

To the close of the year 1915, the most impressive events of the War of the Nations were spectacular but incomplete demonstrations of German military supremacy. In 1914 Belgium and a considerable sector of Northern France had been overrun by German armies, but the French army, prudently commanded by General Joffre, had remained unshattered, and Calais had not been reached; in the summer of 1915 the Russian "steam-roller" had been trundled back from Galicia and from Russian Poland to the Riga-Dvinsk-Prípet Marshes line in a badly battered condition, but von Hindenburg had failed to win Dvinsk or Riga, and the Russian army, though defeated, was not annihilated; in the closing months of 1915 Bulgaria was won to the Turco-Teutonic coalition, Serbia was conquered, and the route opened up from Antwerp through Berlin, Vienna, Nish, and Sofia to Constantinople and even to Bagdad; but an Anglo-French army was left to entrench itself at Saloniki. Three gigantic offensives had won new laurels for the German generals and new territories for the Central Powers, but the Russian army was still able to stand at bay, the "contemptible" little British expeditionary force had been swelled by repeated reinforcements until it was a million strong, and General Joffre was planning a new Anglo-French forward movement for the spring of 1916. The German military machine had brilliantly proved its ability to carry out smashing, irresistible offensives; it had demonstrated its amazing mastery of the new science of trench warfare, which enabled numerically inferior German forces to hold General Joffre's "forward movements" in check; but it had not won the war. Hence it was not surprising that whereas statesmen and journalists in Germany expressed a puzzled inability to understand the stubborn refusal of the defeated Allies to sue for peace, orators and publicists in France and in England gave voice to the immutable conviction

that the "just cause" and preponderant resources of the Entente Allies must ultimately triumph. The war, insisted the Allies, would be decided not by campaigns or by battles, but by men, munitions, and trade. Thus Mr. Winston Spencer Churchill, one of England's most prominent statesmen, with a sublime contempt for ephemeral German victories, might proclaim his belief that: "It is not necessary for us to win the war to push the German line back over all the territory they have absorbed, nor to pierce it. While the German lines extend far beyond their frontiers, while their flag flies over conquered capitals and subjected provinces, while all the appearances of military success greet their arms, Germany may be defeated more fatally in the second or third year of the war than if the Allied armies had entered Berlin in the first year." The factors upon which Mr. Churchill, in common with other Allied and properly observers, counted to ensure the Entente's final victory, may be briefly summarized under five heads. (1) Military manhood. The Turco-Teutonic coalition, if we may place confidence in the calculations of Mr. Hilaire Belloc, one of the most sanguine English historians of the war, was vainly striving by spectacular strategy to conceal the alarming wastage of its military manhood, while the Entente Powers were just beginning to draw upon their human resources. Similarly Mr. Churchill affirmed: "At the outset of the war the number of males capable of bearing arms in Germany compared with the number in this country [Great Britain] was three to two. To-day our [the Allies'] numbers are greatly superior if we use them, and at the end of the second year the original proportion will probably be reversed. We are becoming, therefore, a continually stronger power actually and relatively so far as military manhood is concerned." It was upon the Allies' resources in men that the French military critics counted when they praised General Joffre's persistent war of attrition, which by pin-pricks would bleed the German army to death. Lord Derby's recruiting campaign, backed up by a compulsory military service bill, promised at last to place the full military strength of the British nation in the field. The Russian "hordes" would still probably suffice to recruit new Russian armies in replacement of those Grand Duke Nicholas had lost. The French with grim courage were sending mere striplings to the front. (2) Economic resources. Even should the Allies fail to overwhelm the Central Empires by sheer weight of numbers, it was believed that the failure of Germany's economic resources would bestow the final victory upon the financially invincible coalition of London and Paris. To the student of finance elaborate statistical reviews professed to prove the inevitable bankruptcy of Germany and the financial solidity of France and England. German economists, it is only fair to remark, published similar arrays of figures just as conclusively demonstrating the ability of Germany to endure to the end, thanks to the willingness of her patriotic citizens to invest in the government's war loans, and thanks to more efficient management of resources. Furthermore, the partisans of the Germanic Powers pointed out that the military successes of the Turco-Teutonic armies had immensely improved the economic situation of the Central Powers: the rich coal and iron regions

of Belgium and Northern France had been virtually annexed to Germany; the agricultural expanses and the industrial resources of Poland and other Russian provinces had been conquered; the herds and the copper mines of Serbia and the food-products of the Balkan countries had been made available by the conquest of Serbia; and the failure of the Anglo-French Dardanelles campaign had ensured the safety of German communications with the vast empire of Turkey in Asia, which if properly developed might supply Germany with much-needed stores of meat, oils, cotton, petroleum, and copper. (3) Naval supremacy. With increasing frequency as the war dragged on, allusion was made to the historic parallel of the present war, the contest between Napoleon's military might and Britain's naval supremacy. As sea-power at the beginning of the nineteenth century had overcome invincible armies then, so it was assumed that England's super-dreadnoughts would overcome Germany's armies in the twentieth century. Command of the seas enabled the Allies to utilize their own resources to the full, to preserve their own trade, to "capture" German trade, and to institute a virtual blockade of Germany. Germany's attempt to break the blockade by means of submarines had failed. It remained to be seen whether German efficiency, which had already staved off a food crisis, could so wisely regulate the economic life of the nation, and so advantageously exploit the resources of Belgium, Poland, the Balkans, and Asiatic Turkey, that the British navy would be unable to reverse the victories of German armies. (4) Diplomacy. At the close of the year public opinion in Allied countries definitely counted upon and expectantly awaited the intervention of new Allies against the Central Powers. Above all, Rumania was momentarily expected to enter the war, to conquer from Austria-Hungary at least part of the coveted provinces of Bukovina, Transylvania, and the Banat. The Germans, on the other hand, seemed to be confident that Rumania's neutrality, if not her sympathy, had been secured by Teutonic diplomacy. Furthermore, Sweden showed some signs of irritation against British contraband rules, and journalists speculated on the possibility of Sweden's intervention on the German side. (5) Finally, the spokesmen of the Allied Powers continued to voice the hope that the military and governmental authorities of the Central Powers would be handicapped by a revulsion of popular sentiment against the war and against "Prussian militarism"; that the Slavic nationalities in Austria-Hungary would refuse to fight for a distasteful government; and that the Arabs would rebel against the Turks, and the more conservative and reasonable elements in Turkey would become disgusted with Enver Pasha's "Young Turk" clique. To be sure, the enthusiastic valor of the Teutonic and Turkish armies proved that the popular discontent with "German militarism" was less universal than had been supposed; but reports of Socialist demonstrations in Germany, of popular insurrections in Austria-Hungary (see AUSTRIA-HUNGARY), and of unrest in Turkey, bolstered up the conviction of the Allies that in defending the cause of "liberty, democracy, and humanity," against Prussian "militarism" and Turkish "barbarism," they might to some extent enlist the sympathy of the "oppressed masses" in

the Central Powers and Turkey. If, on the whole, the year had disappointed the Allies' hopes of serious popular insubordination in the Central Powers, it had likewise disappointed the Germans' expectation of Moslem revolutions in India and in Egypt. Summing up the situation at the end of the year, then, the hackneyed statement may be once more reaffirmed that the war had become a war of resources, but with this modification, that the relative resources of the contending coalitions of the Powers might be considerably and even decisively altered by great German victories or defeats, and by "imponderable" political factors.

IX. PEACE NEGOTIATIONS

In the light of the foregoing discussion, the futility of negotiations for peace during the year 1915 should be patent. Recurrent rumors from Rome throughout the year affirmed that the Pope, through the instrumentality of Teutonic, French, and Belgian cardinals, was indefatigably laboring to bring the lamentable European conflict to a speedy and happy termination; but no authoritative statement of His Holiness' activities in this field has yet been vouchsafed to the public, and the arrangement for the mutual exchange of hopelessly crippled soldiers between the belligerents remained the only well-verified achievement of papal diplomacy. Moreover, not to mention the Socialists' pacific propaganda (see SOCIALISM), the chivalric voyage of Mr. Henry Ford, with a band of adventurous pacifists, from America, with the altruistic object of persuading the unhappy nations of Europe to desist from their insensate conflict, must at least be mentioned in this connection, although it failed to achieve its aim. The Teutonic Powers appeared to be ready for peace—on their own terms; and Italy seemed to lack determination in the war; but, before peace could be made in Europe, either France and England must undo the Teutonic victories of 1914-15, or Germany must, by new and more ambitious campaigns, bring Great Britain to defeat or compromise.

X. BIBLIOGRAPHY

NOTE. The following bibliography is offered, not as an exhaustive catalogue of war literature, but simply as a guide to assist the casual reader in selecting a few of the most useful and most valuable of the countless books, pamphlets, and articles which have been written about the war. For more extensive bibliographies, and for notices of new publications, the reader is referred to F. W. T. Lange and W. T. Berry: *Books on the Great War* (London, Grafton and Co., 1915-), an annotated bibliography appearing serially; Library of Congress: *List of References on Europe*. . . (Washington, Government Printing Office, 15 cents); G. W. Prothero: *List of Publications Bearing on the War* (London, Central Committee, Patriotic Organizations, 1915); the *Book Review Digest*, a current guide to new books; the *Reader's Guide to Periodical Literature* (monthly); the *Library World*; and the *New York Times Book Review* (weekly).

HANDBOOKS OF THE WAR. Of the many handbooks containing general information about the war, some are hasty and inaccurate compila-

tions, while others possess distinct value as convenient works of ready reference. The following will be found very useful: *New War Encyclopedia and Dictionary* (London, Jarrold); C. K. Sugden, *War Facts and Figures* (London, British Dominion General Insurance Co., Ltd., 1915); *War Book of Facts* (London, Shaw); *Pocket War Dictionary: A Complete Who's Who and What's What* (London, Delow, 1915); Stanley S. Sheip (editor), *Handbook of the European War* (White Plains, N. Y., Wilson); J. W. White, *Text-Book of the War for Americans*. The *World's Work War Manuals* may also be mentioned. Most of the standard annuals and almanacs, notably the *World Almanac*, *Whitaker's*, *Hazell's Annual*, the *Daily Mail Year Book*, and the *Annual Register* contain more or less reliable summaries of the war's principal events. For the German version, consult: *Kürschners Jahrbuch* and the *Deutscher Geschichtskalender* (Leipzig, F. Meiner).

CONTINUED HISTORIES AND COLLECTIONS. Pretentious continued histories of the war and monumental collections of war-material have already begun to make their appearance. Of those published in America, probably the best known are the *New York Times*; *Current History of the War*, a heterogeneous collection, published in monthly installments, containing many valuable historical documents as well as a number of unimportant articles; Frank H. Simonds, *The Great War* (2 vols.), a keenly analytical interpretation, rather than a detailed narrative, of the war's most significant events; and *The Great War* by George H. Allen and Henry C. Whitehead (Philadelphia, George Barrie's Sons, 1915). In England, the leading newspapers are publishing weekly and fortnightly "histories" of the war; of these the *Manchester Guardian History of the War* (fortnightly) and the *Times History of the War* (weekly) are the best. The *Daily Chronicle* and the *Daily Telegraph* have published dozens of pocket-edition books on war-topics. *The Great World War* (London, Gresham), edited by F. A. Mumby, gives a concise discussion of the principal features of the war; Hilaire Belloc, *General Sketch of the European War, the First Phase* (London, Nelson), is characterized by illuminating, but frequently too optimistic, analyses of geographical and numerical factors in favor of the Allies; one of the clearest and most accurate narratives yet written is *Nelson's History of the War* (London, Nelson), by John Buchan. Other continued histories of the war, of rather unequal merit, are: by W. S. Macbean Knight, *History of the Great European War*, part I (London, Caxton); Edgar Wallace, *Standard History of the War*, vol. i (London, Newnes); Newman Flower (editor), *The History of the Great War*, quarterly (London, Waverly Book Company); Capt. A. H. Atteridge, *The First Phase of the European War* (1914), and *The Second Phase*, etc. (London, Hodder and Stoughton, 1915); F. R. Cana, *The Great War in Europe* (London, Virtue); William Le Queux (editor), *The War of the Nations* (London, Newnes). One of the leading French serial histories of the war is edited by Gabriel Hanotaux: *Histoire Illustrée de la Guerre de 1914* (Bordeaux, La Petite Gironde); another *Histoire de la Guerre* has been begun by Lucien Cornet (Paris, Charles Lavauzelle);

but at present the most valuable French work is the admirable collection of communiqués, documents, and articles published serially under the general title, *Pages d'histoire, 1914-1915* (Berger-Levrault, Paris); the same publisher, Berger-Levrault, has announced an *Histoire générale et anecdotique de la Guerre de 1914*, to be edited by Jean Bernard. The *Chronik des deutschen Krieger*, vol. i (Munich, C. H. Beck), and Hans F. Helmolt's compilation, *Der Weltkrieg in Bildern und Dokumenten* (Leipzig, J. M. Meulenhoff), are only two of the many excellent German works.

PERIODICALS. To enumerate the periodicals in which important articles on the war regularly appear would be quite impossible in this brief bibliography. The reader is referred to the *Readers' Guide* and the *Military Digest*, with the suggestion that Hilaire Belloc's weekly articles in *Land and Water*, and Frank H. Simonds's monthly contributions to the *American Review of Reviews* will be found particularly interesting and illuminating, even though the writers' conclusions be not always accepted. Among British magazines, the *Fortnightly* and the *Contemporary*, and among American magazines, the *World's Work* and the *American Review of Reviews*, give special prominence to war articles.

DIPLOMATIC HISTORY. A discussion of the various collections of diplomatic correspondence published by the belligerents will be found in the *YEAR BOOK* for 1914 under the article on the war, and in the present article, under *Controversialists and the War*. A handy volume published by Harrison and Sons, London, contains the *Collected Diplomatic Documents Relating to the Outbreak of the European War*, including the *British White Paper*, the *French Yellow Book*, the *Russian Orange Book*, the *Belgian Grey Book*, the *Serbian Blue Book*, the *German Denkschrift*, the *Austro-Hungarian Red Book*, and other material, carefully indexed. In addition to the earlier diplomatic documents, the *New York Times* and the *American Association for International Conciliation* have made the *Italian Green Book*, the second *Belgian Grey Book*, the correspondence of the United States government with the belligerents, and other recent material, available to the American public. For English readers, more or less partisan, but fairly reliable accounts of the diplomatic maneuvers preliminary to the war have been written by J. W. Headlam, *History of Twelve Days (July 24-August 4, 1914)* (London, Fisher Unwin, 1915); J. Holland Rose, *Origins of the War* (Cambridge University Press, 1914); Ellery C. Stowell, *The Diplomacy of the War of 1914* (Boston, Houghton Mifflin); and M. P. Price (editor), *The Diplomatic History of the War* (London, Allen and Unwin).

CONTROVERSIAL DISCUSSIONS OF CAUSES AND ISSUES. An immense amount of controversial literature has been produced by citizens of neutral as well as by subjects of belligerent countries, in the endeavor to prove or to disprove, as the case may be, the culpability of the German government in precipitating the war. Many eminent British scholars have contributed monographs to the *Oxford Pamphlets*, criticising the policy and impugning the motives of the German government. On the other hand, the *Deutsche Kriegsschriften* (German War

Pamphlets) and *Politische Flugchriften* (*Political Pamphlets*) lay the burden of guilt upon the Allies. Some of the best statements of the case against Germany are: E. P. Barker and other members of the Oxford Faculty of Modern History, *Why We Are at War: Great Britain's Case*; James M. Beck, *The Evidence in the Case* (New York, Putnam's, 1914); E. J. Dillon, *A Scrap of Paper* (London, Hodder and Stoughton, 1914); H. A. L. Fisher, *The War, Its Causes and Its Issues* (Longmans, 1914); Ramsay Muir, *Britain's Case Against Germany* (Manchester University Press, 1914); J. Holland Rose, *The Origins of the War* (Cambridge University Press, 1914); and A. B. Hart, *The War in Europe, Its Causes and Results* (New York, Appleton, 1914). The most striking indictment of the German government purports to have been written by a German; the volume was originally published in Lausanne with the title, *J'accuse: von einem Deutschen*, and has since been translated into French and into English. *Germany's War Mania: The Teutonic Point of View as Officially Stated by Her Leaders* (Dodd, Mead and Company) is a valuable collection of significant utterances by German public men. *Germania contra Mundum*, a brochure by Earl Cromer, sets forth the views of a noted British "empire-builder" as to what Great Britain is fighting for—and against. *The Spirit of the Allied Nations* (Macmillan, 1915), edited by Sidney Low, is a more comprehensive statement of the anti-German viewpoint. For profound discussions of the pernicious influence which German philosophy is alleged to have exerted, consult Prof. J. Dewey, *German Philosophy and Politics* (New York, Holt, 1915), and J. H. Muirhead, *German Philosophy in Relation to the War* (L. Murray, 1915). The German version of the diplomacy that led up to the war has been most ably presented by Hans F. Helmolt, *Die geheime Vorgeschichte des Weltkrieges* (Leipzig, K. F. Koehler, 1914). Paul Rohrbach, *Germany's Isolation* (Chicago, McClurg, 1915, translated from the German), and Col. H. Fobenius, *Germany's Hour of Destiny* (preface by Prof. W. R. Shepherd) argue that the Allies endangered the peace of Europe by endeavoring to isolate Germany diplomatically and to impose restrictions upon her economic expansion. J. W. Burgess, *The European War of 1914: Its Causes, Purposes, and Probable Results*, is a vigorous justification of Germany, written by an eminent American scholar. Gen. Friedrich von Bernhardi, whose explanations of *How Germany Makes War* and forecasts of *Germany and the Next War* have operated so powerfully against the German cause, has replied to his critics in a new volume, *Germany and England* (New York, Dillingham, 1915). C. L. Droste has compiled a comprehensive indictment of the Allies, consisting of *Documents on the War of the Nations from Neutral and Anti-German Sources* (Richmond, Dietz).

BELGIAN NEUTRALITY. The subject of Belgian neutrality is touched upon by many of the above mentioned controversialists. For more thorough expositions, the reader is referred to *The Case of Belgium*, by the Belgian delegates to the United States (Macmillan, 1914); Emile Waxweiler, *La Belgique neutre et loyale* (Lausanne, Payot, 1915); and *La neutralité de la Belgique* (preface by Paul Ay-

mans, official publication of the Belgian government). The German contention that Belgian neutrality had been violated before the German invasion is best presented by Alexander Fuehr, *The Neutrality of Belgium* (New York, Funk, 1915).

MILITARY OPERATIONS. The best military histories of the war have been noted in the section *Continued Histories and Collections* (*supra*). Among the *Daily Telegraph War Books* and in the *Oxford Pamphlets* will be found fairly detailed narratives of campaigns and battles, such as A. N. Hilditch, *The Stand of Liège*; H. W. C. Davis, *The Battle of the Marne and the Aisne*; Edmund Dane, *The Battle of the Rivers*; Percy Standing, *The First Campaign in Russian Poland*. G. H. Ferris has a volume describing the *Campaign of 1914 in France and Belgium* (London, Hodder and Stoughton, 1915). *Germany in Defeat* is a decidedly biased sketch of the military operations through the battle of the Marne, by Count Charles de Souza and Major H. Macfall. Stanley Washburn's *Field Notes from the Russian Front* (London, Melrose, 1915), supplemented by his more recent volume, *The Russian Campaign* (Scribner's, 1915), brings the story of the operations in the Eastern theatre of war down to the fall of Warsaw. For vivid and impressionistic accounts of military operations, one may read Richard Harding Davis, *With the Allies* (London, Duckworth, 1915); Dr. Sven A. Hedin, *With the German Armies in the West* (London, Lane, 1915); Stanley Washburn (*supra*); Frank Fox, *The Agony of Belgium* (London, Hutchinson, 1915); R. Dunn, *Five Fronts: On the Firing-Lines with English, French, Austrian, German, and Russian Troops* (New York, Dodd, Mead and Co.); or Frederick Palmer's realistic portrayal of life in the trenches, *My Year of the Great War* (Dodd, Mead and Co.). Granville Fortescue has written graphic stories of his adventures in *At the Front with Three Armies* (London, Melrose, 1915), and of the Dardanelles operations. One of the most widely read journalistic descriptions of the war is *Eye-Witness's Narrative of the War: From the Marne to Neuve Chapelle, September, 1914, to March, 1915* (London, Arnold, 1915). For special topics, the following books are useful: J. K. O'Connor, *The Afrikaner Rebellion* (London, Allen and Unwin, 1915); Evans Lewin, *The Germans and Africa*; F. S. Burnell, *Australia versus Germany* (London, Allen and Unwin, 1915); R. Granville Baker, *The Passing of the Turkish Empire in Europe* (Philadelphia, Lippincott, 1915); Marion I. Newbigin, *Geographical Aspects of Balkan Problems* (New York, Putnam); H. C. Woods, *War and Diplomacy in the Balkans* (London, The Field, 1915); Noel and C. R. Buxton, *The War and the Balkans* (London, Allen and Unwin, 1915); Anon., *The Dardanelles: Their Story and Their Significance in the Great War* (London, Melrose, 1915). The atrocities committed by the troops of the belligerent nations have been made the subject of investigations, pamphlets, official reports, and official denials, too numerous to be included in this list.

OFFICIAL DISPATCHES. For the operations of the British troops in France the collected *Despatches* of Field Marshal Sir John French, which have been published in several different editions, furnish an authoritative source. Sim-

ilar compilations of official dispatches and bulletins have been published in German—*Kriegskalender und Kriegsadepeschen nach den amtlichen Berichten* (Berlin, Bong, 1915); and in French—*Grande Guerre: Recueil des communiqués officiels des gouvernements et états-majors de tous les belligérants* (Payot, Paris). A *French Official Review of the First Six Months of the War* has been issued by Reuter's Agency and published by Constable (London).

NAVAL WARFARE. An admirable brief description of *The Fleets at War* is given by Archibald Hurd in one of the *Daily Telegraph War Books*. The same author has described *The German Fleet* (Hodder and Stoughton, 1915). For reference purposes, the following may be consulted to advantage: Fred. T. Jane, *Fighting Ships for 1914*; *Brassey's Naval Annual War Edition* (London, Clowes, 1915); *The Fleet Annual and Naval Year Book, War Edition* (Fleet, Limited, 1915); *The Royal Navy List* (Witherby, 1915); *Fleets of the World* (Nash, 1915); and L. G. C. Laughton, *The British Navy in the War* (London, Methuen, 1915). For naval battles of the war, consult the *British Official Navy Despatches* (Graphic, London, 1914); Rear Admiral S. E. Wilmot, *The Battle of the North Sea in 1914* (London, Rees, 1914); L. C. Jane, *The Action Off Heligoland* (Oxford Pamphlets); and *Battles of the South Seas* (Yachting Monthly, 1915). In regard to the effect of the war upon neutral commerce, consult E. J. Clapp: *Economic Aspects of the War* (Yale University Press, 1915); and W. R. Shepherd (editor), *The Protection of Neutral Rights at Sea* (New York, Sturgis and Walton Co., 1915).

AERIAL WARFARE. C. Grahame-White and Harry Harper, *Aircraft in the Great War: A Record and Study* (London, Fisher Unwin, 1915).

BIOGRAPHICAL. For concise information one may consult *Lloyd's Who's Who of the Great War* (Hodder and Stoughton, 1914); the *British Who's Who*; the *German Wer Ist's*; and the *French Qui êtes-vous*, in addition to encyclopædias and year books of recent date. Kurt Mühsam, *Deutsche Heerführer* (Berlin, Haber, 1914, 2 vols.), gives biographies of leading German generals. F. W. Wile, *Men Around the Kaiser* (Heinemann, 1914), and A. G. Gardiner, *The War Lords* (London, Dent, 1915), are interesting studies. Only a few of the many individual biographies may be mentioned: F. W. Hackwood, *Life of Lord Kitchener* (Lippincott); Harold Begbie, *Kitchener* (Boston, Houghton, 1915); H. G. Groser, *Lord Roberts* (Pilgrim Press, 1914); Christian Gauss, *The German Emperor as Shown in His Public Utterances* (New York, Scribner's, 1915); R. P. Mahaffy, *Francis Joseph I, His Life and Times* (2nd edition, London, Duckworth, 1915); Alexander Kahn, *Life of General Joffre* (Heinemann, 1915). A most significant collection of David Lloyd George's speeches has been published under the suggestive title, *Through Terror to Triumph* (G. H. Doran Co.).

OTHER BOOKS. Among the other books bearing upon the war, the following are of special interest and importance: W. E. Walling, *The Socialists and the War* (New York, Holt, 1915); H. G. Wells, *The War and Socialism* (London, Clarion Press, 1914); Gabriel Langlois, *Le clergé, les catholiques, et la guerre* (Paris,

1915); Alfred Loisy, *The War and Religion*, translated from the French by Arthur Galton (Oxford, Blackwell, 1915); F. W. Hirst, *The Political Economy of War* (Dent, 1915), a very remarkable discussion of the war's economic aspects; C. E. Musgrave (editor), *Trade and the War*, trade maps, charts, and statistics (London Chamber of Commerce, 1915); Norman Angell, *The Problems of the War and the Peace* (London, Heinemann, 1915); Gilbert Slater, *Peace and the War in Europe* (London, Constable, 1915); J. A. Hobson, *Towards International Government* (London, Allen and Unwin, 1915); Murray H. Robertson, *Krupp's and the International Armaments Ring* (London, Holden and H., 1915); Coleman Phillipson, *International Law and the Great War* (London, Fisher Unwin, 1915); Norman Angell, *The World's Highway* (George H. Doran Co., 1915); G. D. H. Cole, *Labour in War Time* (Macmillan, 1915). Of the books more especially concerned with the effect of the war upon the United States, Roland G. Usher, *Pan-Americanism* (Century Co.), Hugo Muensterberg, *The War and America* (Appleton), and Theodore Roosevelt, *America and the World War* (Scribner's), have been sufficiently read to warrant their insertion, but not necessarily their recommendation, in this list.

WARREN, SAMUEL PROWSE. American composer and organist, died Oct. 7, 1915. He was born in Montreal, Canada, in 1841. From 1861-64 he studied music in Berlin, and in 1865 became organist in New York City. After two years at All Souls Church, he was appointed in 1868 organist of Grace Church, New York. He held this position until 1874, when he became organist at Holy Trinity. After two years he returned to Grace Church, where he remained until 1894. From 1891 until his death, he was organist at the First Presbyterian Church in East Orange, N. J. He was conductor of the New York Vocal Union, from 1880 to 1888. He composed many anthems, part-songs, songs, organ and piano solos, and transcriptions.

WASHBURN, GEORGE. American clergymen and educator, died Feb. 15, 1915. Born in Middleboro, Mass., in 1833, and graduated from Amherst College in 1853, he spent one year at Andover Theological Seminary, and was ordained to the Congregational ministry in 1863. Prior to that time he had served as missionary under the American Board at Constantinople. After continued service in this capacity until 1868, he was appointed professor of philosophy at Robert College, Constantinople. He was acting president of that institution from 1870 to 1878, and president from the latter year until 1903, when he resigned. He was a recognized authority upon questions of politics in southeastern Europe. In 1909 he was lecturer at the Lowell Institute in Boston. He was the author of *Fifty Years in Constantinople*, and was for many years a regular contributor to important American and English periodicals.

WASHINGTON. POPULATION. The estimated population of the State on July 31, 1915, was 1,471,043. The population in 1910 was 1,141,990.

AGRICULTURE. The acreage, production, and value of the principal crops, as estimated by the United States Department of Agriculture in 1914-15, were as follows:

		<i>Acres</i>	<i>Prod. Bu.</i>	<i>Value</i>
Corn	1915	39,000	1,053,000	\$811,000
	1914	36,000	972,000	710,000
Wheat	1915	2,030,000	50,894,000	41,324,000
	1914	1,780,000	41,840,000	41,840,000
Oats	1915	275,000	13,750,000	5,088,000
	1914	297,000	13,959,000	5,863,000
Rye	1915	8,000	146,000	110,000
	1914	8,000	158,000	134,000
Barley	1915	175,000	7,263,000	4,067,000
	1914	182,000	7,098,000	3,691,000
Potatoes ..	1915	61,000	8,235,000	4,365,000
	1914	59,000	7,582,000	4,154,000
Hay	1915	812,000	1,868,000	20,174,000
	1914	796,000	1,751,000	19,261,000

a Tons.

LIVE STOCK. The United States Department of Agriculture estimated that on Jan. 1, 1916, and Jan. 1, 1915, horses numbered 308,000 and 311,000 valued at \$28,952,000 and \$29,856,000, mules numbered 15,000 and 15,000 valued at \$1,590,000 and \$1,560,000, milch cows numbered 263,000 and 253,000 valued at \$15,912,000 and \$18,722,000, other cattle numbered 221,000 and 215,000 valued at \$6,696,000 and \$7,504,000, sheep numbered 568,000 and 546,000 valued at \$3,010,000 and \$2,621,000, swine numbered 314,000 and 327,000 valued at \$2,669,000 and \$3,607,000. The production of wool in 1915 and 1914 was 3,638,000 and 3,818,000 pounds respectively.

MINERAL PRODUCTION. The production of gold in the State in 1914 was \$557,173, a decrease of \$139,102 from the value of 1913. The production of silver was 264,861 fine ounces valued at \$146,468, compared with 331,239 ounces valued at \$200,068 in 1913. The total production of coal in the State in 1914, was 3,064,820 short tons valued at \$6,751,511. With the exception of 1905 and 1908 the total output of coal in 1914 was the lowest since 1902. The production of coal in Washington has been considerably reduced in recent years by the output of petroleum in California and its use as a fuel for manufacturing, railroads, and steamers. Other causes contributing to the decrease were the general industrial depression, particularly in the lumber business, and the exceptionally mild weather during the winter months. The value of the total mineral production in 1914 was \$13,830,739 compared with \$17,579,743 in 1913.

TRANSPORTATION. The total mileage of the railways in the State on July 30, 1915, was 8022. This includes mileage of all kinds. The increase of mileage during the year amounted to 425 miles. Railways having the longest mileage were the Great Northern 1196, Oregon and Washington 992, Chicago, Milwaukee, and St. Paul 583, and the Northern Pacific 1955.

EDUCATION. The total school population in 1915 was 303,614. There were enrolled in the public schools 240,521, with an average daily attendance of 190,129. The teachers numbered 7276 females, and 1792 males. The total expenditures for the support of the schools were \$12,889,495.

FINANCE. The total receipts for the fiscal year ending Dec. 30, 1915, amounted to \$11,927,794. The disbursements amounted to \$10,945,613. There was a balance in the treasury on Oct. 1, 1914, of \$3,850,284, and on Sept. 30, 1915, of \$4,842,465.

CHARITIES AND CORRECTIONS. The charitable and correctional institutions include Western Hospital for the Insane, Eastern Hospital for

the Insane, Northern Hospital for the Insane, Institution for the Feeble-minded, State Soldiers' Home, Washington Veterans' Home, School for the Deaf, School for the Blind, State Penitentiary, State Training School, State School for Girls, and the State Reformatory.

POLITICS AND GOVERNMENT. A minimum wage law applying to women, boys, and girls went into effect on February 20th. The schedule is \$10 a week for women and girls employed in offices at any kind of clerical work, \$8 per week for office boys and girls more than 16 years of age, but under 18, and \$6 for both sexes under 16.

STATE GOVERNMENT. Governor, Ernest Lister; Lieutenant-Governor, Louis F. Hart; Secretary of State, I. M. Howell; Treasurer, Edward Meath; Auditor, C. W. Clausen; Superintendent of Education, Mrs. Josephine Preston; Attorney-General, W. V. Tanner; Adjutant-General, Maurice Thompson; Commissioner of Agriculture, H. T. Graves; Commissioner of Insurance, H. O. Fishback—all Republicans except Governor, Adjutant-General, and Commissioner of Agriculture, who are Democrats.

JUDICIARY. Supreme Court: Chief Justice, George E. Morris; Associate Justices, Frederick Bausman, O. G. Ellis, M. A. Fullerton, W. Mount, O. R. Holcomb, S. J. Chadwick, Emmett N. Parker, and J. F. Main; Clerk, C. S. Reinhart.

STATE LEGISLATURE:

	<i>Senate</i>	<i>House</i>	<i>Joint Ballot</i>
Republicans	29	79	108
Democrats	6	13	19
Progressives	7	5	12
Republican majority ..	16	61	77

WASHINGTON, BOOKER T. American negro educator, died Nov. 14, 1915. He was born, according to his best knowledge, near Halesford, Franklin County, Va., in either 1858 or 1859. His mother was a slave, and he himself was born in slavery. The name Booker was given him by his mother as a joking allusion to his early fondness for books. The name Washington he himself assumed later. The initial T. stood for Taliaferro, which he had heard was the name of his father. The boy, in his earliest youth, had aspirations for an education. Soon after the close of the Civil War he went to Malden, W. Va., where he worked in the salt mills for nine months in the year, attending school for three months. The task of gaining an education proved a difficult one. He managed to find time to attend a night school, and finally, by promising to begin work unusually early in the morning and to keep at it unusually late in the evening, he was able to attend day school with some regularity. After several years spent in this manner, accumulating what bits of knowledge he could and working hard in the meantime, Washington found work in the house of a New England woman, where he remained until 1861. He then heard of the school for negroes at Hampton, Va., and resolved to go there. He took what little money he had been able to save from his wages of \$6 a month, and made his way to Hampton on foot. He was warmly received by the principal of the institution, General Armstrong, for whom he always retained the greatest affection



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BOOKER T. WASHINGTON
Died November 14, 1915

and loyalty. He remained at Hampton until he had graduated from school with the honors of his class, having worked his way through the entire course. After his graduation he returned to his own home in Virginia, and taught school for a time before he continued his studies at Wayland Seminary, in Washington, D. C. While in that institution, he was invited to become a teacher at Hampton, and remained there for two years. In 1881 the citizens of Tuskegee, Ala., appealed to General Armstrong for an institution along the lines of the school at Hampton, which would develop negroes into useful citizens, teaching them self-respect, giving them the ability to support themselves, and stirring them with proper ambition. Booker Washington was chosen to found such an institution. When he arrived at Tuskegee, there were neither lands nor building. In fact, the resources of the new institution were only a promise of \$2000 annually from the State of Alabama towards the expenses of the school. Washington worked at the establishment of the institution with an energy and optimism which never flagged. He began his work in a small shanty with one assistant, instructing 30 pupils. From that time on the growth of the institution was phenomenal. The graduates from Tuskegee were found to be a new sort of negroes, with competent minds and hands, who had self-respect, and who had been taught to make an adequate living. The success of the institution inspired interest in the work throughout the country, and Washington became famous as the most prominent educator of his race. New buildings were constructed at Tuskegee chiefly by the students themselves. In 1915 there were 50 buildings worth \$2,000,000 or more, and property of 2000 acres.

Washington first became a national character in 1894, when he spoke for the negro on the opening day of the Atlanta Exposition. He had previously acquired some local fame as an orator, but on this occasion he was held as the successor of Frederick Douglass and the leader of the negro race. He was thereafter in great demand as a popular speaker and appeared before many of the best known organizations in the country. His powers as an orator were remarkable. Mr. Washington's creed concerning his people was well explained in his own words: "We must teach our young people to save their money. We must cease to have the reputation of a spending, shiftless, thriftless, and poverty-stricken race. It is vitally necessary for the progress of the race that we become creators of enterprise, and not dependent on the good will and energy of other races."

Although Dr. Washington was by no means the first of his race to demonstrate the fact that colored people may be trained to become efficient and useful citizens, he was undoubtedly the greatest educator ever produced by his race. It is probable that no negro was ever more honored by white men than he. This often led to embarrassing situations. President Roosevelt at one time entertained him at dinner at the White House and thereby greatly scandalized many people in the South. He became intimate with Andrew Carnegie, and the latter eventually gave \$600,000 to the Tuskegee Institute. Dr. Washington's work among the members of his race was based upon the belief that the negro would win social and political advance-

ment only after he had achieved economic independence and stability. He held that time was better spent in demonstrating the capacity of the black man in those callings that are now open to him than in seeking opportunities in fields where every factor was opposed to him. This policy brought him into conflict with other leaders of his race, whose demand was for higher education for the negro, and for other opportunities such as white men enjoyed. Dr. Washington's last public appearance was at the National Council of Congregational Churches in New Haven, Conn., in October, 1915. It is said that he made there one of the best speeches of his life. Shortly after this, he suffered with the nervous breakdown which ended in his death. He wrote and spoke much on educational subjects. His published writings include: *Future of the American Negro* (1899); *Sowing and Reaping* (1900); *Up from Slavery* (1901); *Character Building* (1902); *The Story of My Life and Work* (1903); *Working with Hands* (1904); *Tuskegee and Its People* (1905); *Putting the Most into Life* (1906); *Life of Frederick Douglass* (1907); *The Negro in Business* (1907); *The Story of the Negro* (1909); *My Larger Education* (1911); and *The Man Farthest Down* (1912). He received honorary degrees from Harvard University and Dartmouth College.

WASHINGTON, UNIVERSITY OF. A State institution for higher education, founded in 1861 at Seattle, Wash. The total enrollment in all departments in the autumn of 1915 was 2851. The faculty numbered 165. In June, 1915, Dr. Henry Suzzallo, of Columbia University, was elected president. Miss Isabella Austin, dean of women, died in August, 1915; and Miss Ethel Coldwell was appointed in her place. Arthur Tegan Priest, who was formerly dean of the college of liberal arts, was appointed professor of debating. The productive funds of the university in 1915 amounted approximately to \$50,000, and the annual income to \$25,000. The library contained about 73,000 volumes.

WASHINGTON AND LEE UNIVERSITY. An institution for higher education, founded in 1749 at Lexington, Va. The total enrollment in all departments in the autumn of 1915 was 501. The faculty numbered 32. G. G. Greever, Ph.D., was appointed associate professor of English; William D. Hoyt, Ph.D., was appointed associate professor of biology; and Robert A. Tucker, M.A., associate professor of commerce. The productive funds on April 30, 1915, amounted to \$864,902, and the annual income to \$104,759. The library contained about 50,000 volumes. The president was Henry Louis Smith, Ph.D.

WASHINGTON SQUARE PLAYERS. See **DRAMA, AMERICAN AND ENGLISH.**

WASHINGTON UNIVERSITY. An institution for higher education, founded at St. Louis, Mo., in 1853. The total enrollment in all departments in the autumn of 1915 was 1841, which included 587 in Saturday courses for teachers, and others in evening courses. The faculty numbered 218. There were no notable changes in the membership of the faculty during the year, and no noteworthy benefactions were received. The productive funds amounted in the autumn of 1915 to \$9,123,184, and the income to \$716,471. The library contained 153,323 bound volumes and 58,008 pamphlets. The chancellor was David F. Houston.

WASSERMAN, JACOB. See GERMAN LITERATURE, *Fiction*.

WASTE PRODUCTS, UTILIZATION OF. See AGRICULTURE.

WATER POWER. See ELECTRIC POWER, TRANSMISSION OF.

WATER PURIFICATION. One after another such of the public water-supplies of the country as are from rivers, lakes, and other surface sources, and thereby liable to pollution, are being subjected to purification—as have been surface supplies generally in England and in Germany for years. Not many years ago scarcely an American city of any size had a water-purification plant of any kind. To-day nearly all of them are drinking water that has at least been chlorinated or disinfected for the elimination of possible disease germs, chiefly typhoid fever. During 1915 large mechanical water-filtration plants were completed and put in operation by Baltimore and St. Louis, and a similar plant was well on towards completion by Cleveland. Most of the recently constructed filtration plants are of the rapid or mechanical rather than the slow sand type. This is due in large part to greater ease and less labor of operating the mechanical filters, which are cleaned by merely reversing the flow of water through them, sometimes supplemented by compressed air to aid in agitating the sand. Most of the slow sand filters are cleaned by means of a considerable amount of labor. Chlorine disinfection is now widely used as a finishing process with both types of filters. It goes far towards removing whatever feeling some sanitarians held as to the greater reliability of slow sand as compared with mechanical filters, and in addition it lessens the amount and therefore the cost of the sulphate of alumina used as a coagulant in connection with mechanical filtration. Liquid chlorine instead of hypochlorite of calcium is now being used for most new disinfecting plants and is replacing the hypochlorite where that was previously used. The liquid chlorine is bought in heavy steel or iron cylinders. It turns to gas when it is released from pressure. The hypochlorite is bought in sheet steel drums, is troublesome to handle, and requires double sets of solution and dosing tanks. The apparatus for applying liquid chlorine is much simpler and the rate of dosing is more easily and accurately controlled. European war conditions were held responsible for heavy increases in the price of both sulphate of alumina and hypochlorite during 1915, and for a relatively light increase in the price of liquid chlorine. The increased price of sulphate of alumina added materially to the cost of mechanical filtration, but disinfection by either hypochlorite or liquid chlorine costs so little at normal prices for the chemical that even a heavy rise is no great burden. The rapid increase in filtration of one kind or the other and the general use of disinfection of both filtered and unfiltered surface water supplies has doubtless contributed materially to the marked decline in the typhoid death rate in recent years. In a fair number of American cities this rate is now closely approaching the very low European figure which has prevailed for many years past.

WATER SUPPLY. See AQUEDUCT.

WATER-WORKS. Statistics published early in 1915 show 4872 towns in the United States having public water-supplies, of which 435 were supplied from works in other towns. Water-

works were combined with lighting plants in 969 cases. For Canada, 313 towns were listed, 75 of which had combined water and lighting plants. The distribution of towns supplied by States and provinces, as well as the number of towns supplied with water in England and Wales, may be found under MUNICIPAL OWNERSHIP. See also WATER PURIFICATION. For summarized descriptions of the water-works of the United States and Canada, see *The McGraw Water-Works Directory, 1915* (New York), and for descriptions of the water-works of England and Wales, see *Return as to Water Undertakings in England and Wales* (London).

WATSON, WILLIAM. American scientist and educator, died Sept. 30, 1915. He was born in Nantucket, Mass., in 1834, and graduated from Harvard in 1857. In the same year he was appointed instructor in differential and integral calculus at the Scientific School at Harvard, holding that position for two years, when he took postgraduate courses in Jena and Paris. He was university lecturer at Harvard in 1863-64. Information concerning technical education which he gathered in Europe was made the basis of the organization in 1864 of the Massachusetts Institute of Technology, in which from 1865 to 1873 he was professor of mechanical engineering and descriptive geometry. In 1884 he became secretary of the American Academy of Arts and Sciences, and continued to hold this position until his death. He was a member of many scientific societies both in the United States and abroad. His published writings include: *Technical Education* (1872); *Descriptive Geometry* (1873); *On the Protection of Life from Casualties in the Use of Machinery* (1880); *Courses in Shades and Shadows* (1889); and many technical papers.

WEATHER. See METEOROLOGY.

WEATHER BUREAU. See METEOROLOGY.

WEED CONTROL. See AGRICULTURE.

WEIDNER, REVERE FRANKLIN. An American theologian, died Jan. 6, 1915. He was born in Lehigh County, Pa., in 1851, and graduated from Muhlenburg College in 1869. After studying at the Lutheran Theological Seminary, he was ordained to the Lutheran ministry in 1873, and in the same year became a pastor at Phillipsburg, N. J. He remained there until 1878, at the same time acting as professor of English history and logic at Muhlenburg College. From 1878-82 he was pastor at Philadelphia, and in the latter year was appointed professor of dogmatics and exegesis at the Augustana Theological Seminary, remaining there until 1891, when he was made president and professor of dogmatic theology and Hebrew exegesis at the Chicago Lutheran Theological Seminary. He held this position until his death. He was the author of many theological works. These include: *A Commentary on the Gospel of Mark* (1881); *Biblical Theology of the Old Testament* (1886); *Studies in the Book—New Testament* (3 vols., 1890); *Old Testament, Volume 1, Genesis* (1892); *Biblical Theology of the New Testament* (1891); *Christian Ethics* (1891); *The Doctrine of the Ministry* (1907); *The Doctrine of Man* (1912); *Christology, or the Doctrine of the Person of Christ* (1913).

WEIGHTS AND MEASURES. The tenth annual conference on the weights and measures of the United States, held as usual at the Bureau of Standards, Washington, D. C., took

place on May 25 to 28, 1915, and was attended by a large number of commissioners of weights and measures, and other officials of the various States. This conference adopted a schedule of tolerances and specifications for weights and measures, and weighing and measuring devices, which were designed to apply to the usual types of weights, and measures, and apparatus used in ordinary commercial transactions. These specifications dealt with liquid capacity, measures, measuring pumps, milk bottles, dry capacity measures, and scales, and it was hoped that their adoption in the various localities of the country would produce much needed uniformity and increased accuracy. During the year the United States Bureau of Standards put into service a second test car for testing track scales, and considerable improvement was to be noted in the railway track scales of the country, although much remained to be done. The original set of standard weights used on the first test car were redetermined, and their errors were found to be practically inappreciable.

A novel track scale known as a "plate fulcrum" track scale, was installed during the year by the Pennsylvania Railroad Company at East Tyrone, Pa., in a large gravity yard. This scale was designed jointly by A. H. Emery, and members of the engineering departments of E. and T. Fairbanks and Company, and the Pennsylvania Railroad. It had no pivots, knife edges, bearing steels, loops, or links in connection with the vibratory system, and for the regular knife edge a plate fulcrum similar to that used in testing machines and dynamometer was employed. This scale gave satisfactory results in exhaustive tests and was in regular use by the Pennsylvania Railroad.

On December 6th a bill was introduced into the House of Representatives to establish the metric system of weights and measures, as the sole standard of the United States on and after July 1, 1920, and this was typical of the movement to reopen again the old question of the introduction of the metric system. The growth of South American and foreign trade was urged as a strong argument in addition to the familiar recommendations of scientists that had figured in previous campaigns.

A number of conferences were held during the year by the National Association of Scale Experts, the American Scale Men's Association, and various State organizations of sealers. The *Scale Journal*, published in Chicago, entered on its second volume, and was publishing a large number of papers having to do with the test and manufacture of weights and various measuring devices.

In several States during the year, inspections were made of the prescription scales and measures of pharmacists, and in Wisconsin the Dairy and Food Commission and Weights and Measures Office formulated specifications and tolerances for prescription scales and balances which were to become effective Jan. 1, 1916. A report made by the city sealers of Wisconsin for the year ending June 30, 1915, indicated that 22.3 per cent of the prescription scales had to be condemned for repairs or condemned outright, and that 7.4 per cent had to be adjusted. Of weights tested, 20.6 per cent were condemned either for repairs or outright, and 13.6 per cent had to be adjusted before being sealed. See also AGRICULTURAL LEGISLATION.

WEIHAIWEI. A British leasehold, since 1898, on the north coast of the Shantung Peninsula, China. It includes, besides the port and bay, a strip of land 10 miles wide along the coastline of the bay, the Island of Liukung, and all the islands in the bay. Area, 285 square miles. Population (1911), 147,177. The native town of Weihaiwei has about 2000 inhabitants. The port is duty-free. Revenue in 1913-14, £9378; expenditure, £16,696; grant-in-aid, £8300; grant-in-aid in 1912-13, £6000, and in 1914-15, £5000. The territory is administered by a commissioner, resident at Port Edward, on the mainland.

WELFARE WORK. See SOCIAL ECONOMICS.

WELLAND CANAL. See CANALS.

WELLESLEY COLLEGE. An institution for higher education of women, founded at Wellesley, Mass., in 1875. The total enrollment in all departments in the autumn of 1915 was 1512. The instructors numbered 162. There were no notable changes in the membership of the faculty during the year. A \$2,000,000 endowment fund was completed through gifts on Jan. 1, 1915. The productive funds amounted to about \$3,000,000, and the annual income to \$127,000. The library contained about 85,000 volumes. The dean was Ellen F. Pendleton.

WELLS, H. G. See LITERATURE, ENGLISH AND AMERICAN, *Fiction and Essays*.

WESLEYAN METHODIST CONNECTION OF AMERICA. This denomination had its origin as a protest against slavery in the United States. It was founded in 1843, and attracted a large number of members of the Methodist Episcopal and other churches who were opposed to the attitude of their respective churches on the slavery question. General dissatisfaction with the episcopal form of government led, in the organization of the new church, to the adoption of a constitution based largely on that of the Federal government of the United States, so that it was often called in the early part of its history, the Congregational Methodist Church. After the close of the Civil War many who had joined the new church, recognizing that the object for which it had been founded was accomplished, returned to the churches to which they had originally belonged or joined other churches; but a considerable number adhered to the new organization, which became the nucleus of an aggressive reform body which has since been successfully maintained. Separation from all worldly and sinful alliances on the part of Christian people, and the advocacy of the Wesleyan doctrines of justification and holiness as essential to salvation, fill a prominent place in the thought and work of this denomination, as well as work for the adoption of other needed reforms, such as prohibition of the liquor traffic.

Evangelistic work in America and missions in India and Africa are maintained, with the result of a steadily increasing membership. In 1915 there were 20,500 members, 675 churches, and 840 ministers. Sunday school work engages an increasing share of attention. The denomination has three schools of college grade: at Houghton, N. Y., Miltonvale, Kan., and Central, S. C. There is also a theological school at Fairmount, Ind., and a school for colored people in Alabama.

WESLEYAN UNIVERSITY. An institution for higher education, founded in 1831 at Middletown, Conn. The total enrollment in all

departments in the autumn of 1915 was 504. The faculty numbered 48. Edgar S. Brightman was appointed associate professor of ethics and religion, Charles R. Hoover was appointed associate professor of chemistry. The productive funds at the end of the fiscal year amounted to \$2,414,768, and the income to \$185,639. The library contained about 102,000 volumes.

WESTERN AUSTRALIA. A state of the Commonwealth of Australia bounded on the east by the Northern Territory and South Australia. Its area, 975,920 square miles, is more than 20 times as large as Louisiana. Population, according to the 1911 census, 282,114, exclusive of full-blooded aboriginals; 1913 estimate, 320,657. The capital is Perth; its population, with suburbs, in 1911 was 106,792. The executive authority is vested in a Governor appointed by the crown and aided by a council of ministers. There is a Parliament consisting of the Legislative Council of 30 members elected for six years, and the Legislative Assembly of 50 members elected for three years. The Governor in 1915 (from March, 1915) was Maj.-Gen. Sir Harry Barron; premier, colonial treasurer, and minister for railways, John Scadden. Sir Newton J. Moore was appointed agent-general of West Australia to London in order that the products of the state might be brought more directly to the attention of the people of the British Kingdom. See AUSTRALIA.

WESTERN RESERVE UNIVERSITY. An institution for higher education, founded at Cleveland, Ohio, in 1826. The total enrollment in the autumn of 1915 was 2066. The faculty numbered 261. In 1915 the university purchased 12 acres of land, known as the Ford land, lying to the east of the campus of Adelbert College. The School of Medicine building will be erected on this site. The productive funds amounted to \$3,441,608, and the total income to \$291,005. The library contained about 116,000 volumes. The president was Charles F. Thwing, LL.D.

WEST VIRGINIA. POPULATION. The estimated population of the State on July 31, 1915, was 1,359,474. The population in 1910 was 1,221,119.

AGRICULTURE. The acreage, production, and value of the principal crops, as estimated by the United States Department of Agriculture in 1914-15, were as follows:

	<i>Acreage</i>	<i>Prod. Bu.</i>	<i>Value</i>
Corn 1915	800,000	25,200,000	\$18,648,000
..... 1914	782,000	22,692,000	18,884,000
Wheat ... 1915	800,000	4,500,000	4,860,000
..... 1914	286,000	8,540,000	8,823,000
Oats 1915	120,000	8,480,000	1,775,000
..... 1914	105,000	2,100,000	1,155,000
Rye 1915	16,000	224,000	208,000
..... 1914	17,000	248,000	221,000
Potatoes . 1915	50,000	5,850,000	3,802,000
..... 1914	48,000	2,592,000	2,100,000
Hay 1915	780,000	a 1,095,000	16,425,000
..... 1914	696,000	640,000	11,008,000
Tobacco ... 1915	11,300	b 9,881,000	988,000
..... 1914	10,800	8,856,000	974,000

a Tons. b Pounds.

LIVE STOCK. The United States Department of Agriculture estimated that on Jan. 1, 1916, and Jan. 1, 1915, horses numbered 194,000 and 192,000 valued at \$20,952,000 and \$21,888,000, mules numbered 12,000 and 12,000 valued at \$1,392,000 and \$1,428,000, milch cows numbered 241,000 and 234,000 valued at \$12,050,000 and \$11,934,000, other cattle numbered 362,000 and

338,000 valued at \$13,141,000 and \$12,269,000, sheep numbered 796,000 and 796,000 valued at \$4,060,000 and \$3,582,000, swine numbered 378,000 and 374,000 valued at \$3,402,000 and \$3,590,000. The production of wool in 1915 and 1914 was 3,406,000 and 3,405,000 pounds respectively.

MINERAL PRODUCTION. The output of petroleum in 1914 showed an abrupt decline. There were produced 9,680,033 barrels, compared with 11,567,299 barrels in 1913. The decline was due to a continued smaller output in the Blue Creek pool, and to falling prices in the market, at the season of the year when drilling activity is usually at its height. The value of the oil produced in 1914 was \$18,468,540, compared with a value of \$28,828,814 in 1913.

The production of coal in the State in 1914 exceeded all previous records. There was mined 71,707,626 short tons, valued at \$71,391,408. This was an increase of about 500,000 tons over the production of 1913, which was in its turn banner year. The State continued to maintain its position of second place among the coal producing States. The decrease in some sections were more than offset by the increase of new areas where during the last two or three years development has been increasing rapidly and many new mines have been opened. Strikes in the coal mines of Ohio enabled West Virginia producers to capture for the time being at least, the markets originally supplied by Ohio. The average number of employees in the coal mines in the State was 78,363. The average production of each man was 908 tons. There were during the year 556 fatal accidents in the coal mines. The value of the total mineral products in 1914 was \$134,071,803, compared with \$143,591,272 in 1913. The State ranks second in the Union in value of mineral products.

TRANSPORTATION. The total railway mileage of main track in 1915 was 3704. There were in addition 582 miles of second track. The total mileage of all kinds of track was 6172. Railways having the longest mileage were Baltimore and Ohio, 1115; Norfolk and Western, 445; Chesapeake and Ohio, 731; and Western Maryland, 198. There were 335 miles of street railway in the same year.

EDUCATION. The total school population in the State in 1915 was 409,969. The enrollment in the public schools was 302,600. The average daily attendance was 219,500. The teachers, male and female, numbered 10,065. The total school expenditures in 1914-15 amounted to \$6,883,000.

FINANCE. The report of the State treasurer is for the period from Oct. 1, 1912, to June 20, 1914. There was a balance on June 30, 1914, of \$683,460. The receipts for the year ending June 30, 1914, were \$6,964,377, and the disbursements were \$6,691,537, leaving a balance on June 30, 1914, of \$956,300.

CHARITIES AND CORRECTIONS. The charitable and correctional institutions include Weston State Hospital, Spencer State Hospital, Huntington State Hospital, Welch Hospital, Number 1, McKendree Hospital, Number 2, Fairmont Hospital, Number 2, West Virginia Penitentiary, West Virginia Industrial School for Boys, West Virginia Industrial Home for Girls, West Virginia Schools for the Deaf and Blind, State Tuberculosis Sanitarium, West Virginia Colored Orphans' Home, West Virginia Children's Home.

LEGISLATION. The United States Supreme Court on March 8th overruled as unjust and affording too little profit, the 2 cent passenger rate law.

On January 22nd Charles E. Littlefield as special minister made a report to the United States Supreme Court in which he stated that the State of West Virginia was liable to pay between \$12,000,000 and \$18,000,000 as its share of the State debt of Virginia, before the separation of the two States. The report was the outcome of the request of Virginia made in 1914 that the Court proceed to a final decree on its finding of 1911 that the share of West Virginia was \$700,000 and interest. After the rendering of this decree West Virginia set up a claim to a share in the sinking fund of Virginia as it existed in 1861, and of the stocks of railroads and banks in which money on which the debt was based was invested. Virginia on the other hand claimed that West Virginia should pay interest from 1861. Mr. Littlefield in his report declared that West Virginia should share in the assets, which he valued at \$14,000,000, with the share for West Virginia of \$3,400,000. He held West Virginia liable for interest amounting to \$8,000,000.

The Supreme Court on June 14th decided the case by holding that West Virginia should pay \$12,393,929, as its net share of the Virginia debt at the time of the partition of the State. West Virginia was required to pay \$8,178,000 in interest, computed at 3 per cent from 1891 to date, and 4 per cent from 1861 to 1891. The Littlefield report was upheld in all particulars except that the Court decided that West Virginia was entitled to its share of the assets arising from the original principal debt, and fixed that amount at \$2,966,000.

The Legislature enacted amendments to the prohibition law which limited shipments of liquor into the State, and forbade a person to have liquor in a public place, even for his own use. It also forbade any one to give a drink to another, except in his own home, it being decided that home is the permanent place of residence and not a hotel or other public place.

The Legislature on January 26th voted to submit to the people at the next election an amendment to the constitution providing for woman suffrage.

STATE GOVERNMENT. Governor, Henry D. Hatfield; Secretary of State, Stuart F. Reed; Superintendent of Education, M. P. Shawkey; Auditor, John S. Darst; Commissioner of Agriculture, Howard E. Williams; Attorney-General, A. A. Lilly; Treasurer, E. L. Long; Adjutant-General, John C. Bond; Commissioner of Insurance, J. S. Darst, ex-officio—all Republicans.

JUDICIARY. Supreme Court of Appeals: President, George Poffenbarger; Associate Judges, William N. Miller, L. Judson Williams, Charles W. Lynch, John W. Mason; Clerk, W. B. Matthews.

STATE LEGISLATURE:

	<i>Senate</i>	<i>House</i>	<i>Joint Ballot</i>
Republicans	21	57	78
Democrats	9	29	38
Republican majority..	12	28	40

WEST VIRGINIA UNIVERSITY. A State institution for higher education founded in 1867 at Morgantown, W. Va. The total enrollment

in all departments in the autumn of 1915 was 853. The faculty numbered 105. During the year E. D. Sanderson, dean of the college of agriculture, resigned, and J. L. Coulter was appointed to take his place. Dr. F. L. Strickland was elected to the department of philosophy. The productive funds of the university during the fiscal year 1915 amounted to \$115,104. The income and appropriations from State and national governments amounted to about \$230,000. The library contained 43,500 volumes. Acting president in 1915, Frank B. Trotter.

WHEAT. The climatic conditions throughout the world in 1915 were generally favorable to the growth of the wheat crop and no very extensive areas suffered serious reductions in yield as a result of untoward weather conditions. The production of the Northern Hemisphere, which amounts on the average to about 93 per cent of the world's total harvest, was generally very satisfactory in 1915 and was reported by the International Institute of Agriculture as superior to each of the yields of the preceding 10 years. The same authority estimated the crop at 3,590,000,000 bushels which, together with 225,000,000 bushels produced early in the year in the Southern Hemisphere, mainly in Argentina, Chile, Australia, and New Zealand, made a total world crop of 3,815,000,000 bushels for the calendar year 1915. This output surpassed the average of the last 10 years and the increase was considered as largely due to the expansion of wheat culture in the three great exporting countries, the United States, Canada, and British India. The wheat area of Europe in 1915, as indicated by the incomplete reports at hand, was smaller than the area devoted to the crop the year before, the reduction in acreage being confined largely to Russia, France, and Rumania.

As the wheat harvest in the Southern Hemisphere occurs from December to February, figures on the production for the oncoming harvest at the time when the data regarding the harvest of the summer months in the Northern Hemisphere have been published are not generally available. It may be of interest to state in this connection that practically all of the world's wheat crop is harvested from December to September, the least active month being May, when the harvest is confined mainly to northern Africa. In the United States approximately 20 per cent of the crop is harvested in June, 45 per cent in July, and 35 per cent in August. In some crop statistics the production of the Northern and the Southern Hemispheres within the calendar year is regarded as being of the world's crop year, but in commercial statistics generally the harvests of the Northern Hemisphere are considered as the beginning of the world's crop year and those of the Southern Hemisphere as the close, hence the harvests of the Northern Hemisphere in 1915 and those of the Southern occurring from December, 1915, to February, 1916, furnish the supply for the world's commercial crop year. This commercial method of grouping the crops of the two hemispheres is based on the fact that the surplus from both north and south of the Equator reaches the world's importing countries about the same time.

The estimated yields of different countries in 1915 as compared with the production in 1914 are given in a table under AGRICULTURE (q.v.). Owing to the European war, crop statistics for many countries were not available and in order

to include them in the calculations the International Institute of Agriculture adopted the average production for the last four or five years as the production of the harvest for the year 1915 in the countries for which official data were lacking. About 80 per cent of the estimate of the total production in the Northern Hemisphere was based on official figures for the year. Taking the world's average consumption of wheat for the last five years as representing the requirements for the year 1915-16, the International Institute pronounced the world's supply as ample to meet the demands, especially in view of a large surplus in North America and British India and of promising harvests in Argentina and Australia.

The wheat crop of the United States in 1915 as estimated by the Department of Agriculture amounted to 1,011,505,000 bushels, the highest production in the history of the country and more than was ever produced by any one country in a single year. The area devoted to the crop was placed at 59,898,000 acres, making the average yield 16.9 bushels per acre, likewise larger figures than had ever been reached before. The winter wheat production according to the same estimate was 655,045,000 bushels from 40,453,000 acres, the average yield being 16.2 bushels per acre and the yield of spring wheat 356,460,000 bushels from 19,445,000 acres, or at the rate of 18.3 bushels per acre. The acreage and production of winter wheat stood unsurpassed but larger average yields per acre are on record. The average of spring wheat stood second to that of 1911 but the total production and the average yield had never been surpassed. Based on the average farm value of 92 cents per bushel on December 1st, the total value of the crop was placed at \$930,302,000. The corresponding figures for winter wheat were 95 cents and \$622,012,000 and for spring wheat 86.5 cents and \$308,290,000. See also AGRICULTURE.

WHISKY. See LIQUORS.

WHITE SLAVES. See PROSTITUTION, *passim*.

WHITNEY, ANNE. American sculptor, died Jan. 24, 1915. She was born in Watertown, Mass., in 1821, and was educated in a private school. She early showed a talent for writing verse, and her poems were collected in a volume in 1859. In 1855 she began professional work as a sculptor, and opened (1860) a studio in Watertown. She later studied four years in Europe, and on her return established herself in Boston. Among her best known works are the statues of Samuel Adams, Harriet Martineau, Leif Erikson, and Ethiopia.

WIDENER, PETER A. BROWN. American capitalist, died Nov. 6, 1915. He was born in Philadelphia in 1834, and was educated in the common schools. Before he was 21 years of age he had established a butcher shop of his own in Philadelphia. He soon had a chain of these stores, and was on the way to a moderate fortune. Taking an active part in the politics of Philadelphia, in 1873 he was chosen to fill out an unexpired term of city treasurer; and was subsequently elected for a full term. He had in the meantime become a warm friend of William L. Elkins, who was at that time a dealer in oils. The friendship thus formed lasted up to the death of Mr. Elkins. The two friends early turned their attention to street railways. They purchased an interest in many

of these enterprises in Philadelphia, and finally became owners of the People's Line, the best in that city. In 1886 Messrs. Widener and Elkins with Thomas Dolan came to New York City and joined their forces with the late William C. Whitney and Thomas F. Ryan. They gained possession of the traction lines of the city and formed a merger known as the Interboro-Metropolitan. This was followed eventually by financial disaster, and the dissolution of the merger as far as the Interboro road was concerned. That ended Mr. Widener's career as a street railway magnate in New York City. He acquired a large fortune through these manipulations. He also concerned himself largely and successfully in real estate, with steam railways, electric light and gas companies, industrial corporations, etc. He gave liberally to charities, and, following the death of his son and grandson, benefactions of his amounted to more than \$4,000,000. One of the most notable art collections in the world was his; he specialized in paintings, and possessed fine examples of several of the old masters.

WIDOWS' PENSIONS. See PENSIONS FOR MOTHERS.

WILDER, MARSHALL P. An American comedian and entertainer, died Jan. 10, 1915. He was born in Geneva, N. Y., in 1859. Owing to physical disability, his education was limited to a few terms in a public school. When he was still a small boy, he gave evidences of great talents as a mimic, to which his deformity—he was crippled and of very diminutive stature—gave a certain piquancy. He first started in business as a peddler, and later served as a file boy in Bradstreet's Commercial Agency. He began to give a series of humorous public talks to add to his income, and these were remarkably successful, becoming widely popular. In 1883 he went to London, where he appeared before the Prince of Wales, later King Edward VII; and he made repeated subsequent appearances there. In 1904-5 he made a tour of the world. From 1897 until the year of his death, he appeared continually in vaudeville. In addition to his entertaining, he wrote several books which had a substantial sale. These include *People I've Smiled With* (1888); *The Sunny Side of the Street* (1905); and *Smiling Around the World* (1907). He edited *The Ten Books of the Merry-makers* (1908).

WILLARD, EDWARD SMITH. English actor, died Nov. 9, 1915. He was born in Brighton, England, in 1853, and made his first appearance on the stage in 1869 in the *Lady of Lyons*. After several years of apprenticeship in stock companies and in tours with various stars, he secured his first London engagement at the Covent Garden Theatre in 1875. He played among other parts "Antonio" in the *Merchant of Venice*. He had then several provincial seasons, which called into play the versatility for which he afterwards was distinguished. He acted with notable success in *King Lear*, *A Lesson in Love*, *Society*, and *The New Magdalen*. In 1881 he appeared in the first production of Henry Arthur Jones's *Elopement*. One of his famous parts was that of "Clifford Armytage" in the *Lights o' London*. He had another great success in the *Silver King*. The personality of Mr. Willard, as well as his accomplished art, made him one of the marked figures in the theatrical world. In 1889 he undertook the man-

agement of the Shaftesbury Theatre, where he first attracted the interest of American managers. His first visit to the United States was made under the management of A. M. Palmer in 1890. He played in Palmer's theatre for 22 consecutive weeks, and later toured the country in various directions. His initial season in America was so successful that he made annual American trips thereafter for 13 years, and was one of the most popular English actors who ever visited this country.

WILLIAM OF WIED, PRINCE. See ALBANIA, *History*.

WILLIAMS, JOHN LANGBOURNE. American banker and philanthropist, died Feb. 11, 1915. He was born in Richmond, Va., in 1831, and was educated at the University of Virginia. For a time he taught school, and then, having been admitted to the bar, practiced law. In 1858 he became a banker in Richmond, and was a member of the firm of Lancaster and Company, financial agents of the Confederate States. After the Civil War, he established the firm of John L. Williams and Son. This firm succeeded in decreasing the debt of Virginia incurred by the war, and established many railways, and the Seaboard Air Line. It also succeeded in establishing and building many street railways in Southern cities, and in New York and Baltimore. Mr. Williams represented Virginia for several sessions in the general conventions of the Protestant Episcopal Church, and was vice-president of the American Society of Virginia. Mr. Williams was director or official in many philanthropic institutions. He received an honorary degree from Washington and Lee University.

WILLIAMS, RICHARD RICHARDSON. American editor, died Sept. 30, 1915. He was born in Waterford, Ireland, in 1843, and in 1852 came to the United States with his parents. He attended the academy in Middletown, N. Y., and graduated from the Union Theological Seminary, New York City. In the same year he was ordained to the ministry of the Reformed Church of America. Until 1883 he was pastor at Canajoharie, N. Y., and in the latter year he became editor of the *Iron Age*. He continued in this capacity until his death. He was one of the organizers, and for two years president, of the Hardware Club of New York City.

WILLIAMS COLLEGE. An institution for higher education founded at Williamstown, Mass., in 1793. The total enrollment in all departments in the autumn of 1915 was 514. The faculty numbered 57, including three emeritus professors and three absent on leave. There were no notable changes in the faculty during the year. There were received up to April 1, 1915, contributions to the endowment funds, which amounted to \$105,598. The productive funds and income respectively on the same date were \$1,947,522 and \$83,237. The library contains 80,291 volumes.

WILSON, PRESIDENT WOODROW. See INTERNATIONAL PEACE AND ARBITRATION; UNITED STATES, *passim*; and UNITED STATES AND THE WAR.

WINDWARD ISLANDS. The British West Indian colonies of St. Lucia, St. Vincent, and Grenada; together with the Grenadines, attached partly to Grenada and partly to St. Vincent. Each colony retains its separate institutions, but the three are united for administrative pur-

poses under one Governor. See the articles under the separate titles. The Governor and Commander-in-Chief resides at St. George's, in Grenada. Geographically the Windward Islands include Barbados, Trinidad, and Tobago. The usual length of the voyage from England is 14 days and the mail steamers ply fortnightly.

WINES. See LIQUORS.

WINNECKE'S COMET. See ASTRONOMY.

WIRELESS TELEGRAPHY AND TELEPHONY. The year's progress was marked by constantly widening applications of radio telegraphy for commercial, military, and scientific purposes, and with the aid of new and improved apparatus more reliable communication and over greater distances was secured. In the European war, its employment had become almost commonplace, and many ingeniously contrived portable outfits were put to test of actual service throughout the war zones, in the trenches, on aeroplanes, motor trucks, and even on motor cycles, with remarkable effectiveness. The United States government, continuing its work of construction referred to in the 1914 YEAR BOOK, built several new stations to complete a system previously planned for communicating with United States vessels on any part of the globe. The new station at Darien, Canal Zone, was opened for service in November, 1915, and was communicating regularly with the Arlington Station near Washington, D. C., about 2000 miles distant. It was equipped with an arc generator of the Poulsen type, designed to have a range both for sending and receiving of 4000 miles.

The official "List of Radio Stations of the United States," published late in the year, contained the names of 5073 such stations. The government and commercial installations had increased from 189 in 1914 to 224 in 1915. Of the commercial ship stations there was no change from 1914 to 1915. Of "special" land stations there were 54 in the previous year and 118 in 1915. The largest increase noted was in the general and restricted amateur stations, of which there were 2796 in 1914, and 3836 in 1915, an increase of almost 40 per cent.

At the close of the year the Japanese government had completed a wireless station of 300 kilowatts capacity at Funabashi, near Tokyo, for commercial messages across the Pacific Ocean to and from San Francisco via Honolulu. In the tests of the Japanese plant signals from San Francisco were frequently received with distinctness over the intervening 5600 miles. Two stations were built at Honolulu, Hawaii, one for sending and the other for receiving, so that messages could easily be relayed. It was expected that when the service was inaugurated the rates for transmission of messages would be considerably lower than the existing cable rates. A public radio service was established between Hokkaido, Japan, and Petropavlovsk, on the coast of Siberia. The service included connection as desired from any post office in Japan at a cost of about 25 cents a word.

During the Galveston tornado that occurred in 1915, wireless telegraphy rendered invaluable service to the stricken communities. Communication from Galveston was maintained by the radio apparatus of the United States army transport *Buford* which succeeded in communicating with Fort Sam Houston, 250 miles distant. Another steamer in port, the *Concho*, was prompt

to inform Port Arthur, Texas, of the extent of the disaster. These were the only means of communication for several days. The Bureau of Navigation, Department of Commerce, reported that during the fiscal year of 1915, in the cases of 26 vessels sailing from United States ports, the value of the wireless equipment was clearly demonstrated. Except in the case of the *Lusitania*, the assistance so rendered resulted in the saving of all but two lives. In one instance, that of the Greek steamer *Athenai*, the passengers and crew, 470 in all, were obliged to take to the boats before aid that had been summoned by wireless reached them.

Continuing the service inaugurated at several places in the Northern Hemisphere time signals were sent out from the stations of the Union government of South Africa, for the benefit of mariners in adjacent waters. At Cape Town signals were sent out daily at 11 P. M., lasting an interval of 30 seconds. The extension of wireless facilities in Alaska enabled the forecasters of the United States Weather Bureau to receive daily reports from eight stations in that Territory and the islands adjacent thereto. In Australia, the radio stations at Sydney and Melbourne carried on a series of exchange time signals for the exact determination of longitude. The Standard Oil Company replaced the German-owned Telefunken wireless apparatus in use on 22 of its steamers with American Marconi apparatus, making a total fleet of 47 ships thus equipped owned by the company. A fleet of 36 1400-ton barges under construction for service on the Mississippi were being equipped with wireless apparatus of 2 kilowatt capacity each, for the purpose of keeping their agents in touch with the location and disposition of cargoes as well as to render assistance in case of accident or wreck.

The United States army signal corps were using a portable radio equipment consisting of a 2 kilowatt set having the alternating current generator driven through special gearing by the engine of a motor truck. The complete set weighed 5000 pounds loaded, and carried a telescopic 80-foot mast supporting umbrella-type antennae. This unit could communicate 150 miles and could be regularly depended on at 100 miles. The signal corps also experimented during the year with wireless aërials suspended from box kites. It was found possible to transmit messages as far as 150 miles, although the range of the field set used was ordinarily only 25 miles. The receiving range was correspondingly increased, and experimenting in Eastern Massachusetts members of the signal corps were able to receive messages satisfactorily from Arlington, Va., and at times to intercept signals from as great a distance as Bermuda.

The Sayville, L. I., plant of the Atlantic Communication Company, a subsidiary of the Telefunken Company of Germany, was suspected of transmitting unneutral messages from German sympathizers in the United States, particularly concerning shipments of munitions to the Allies. On July 9th it was taken in charge by the United States government and placed under the supervision and censorship of suitable officers of the navy radio service. In his annual report, Capt. W. H. G. Bullard, superintendent of the navy radio service, recommended that the government control and operate all coastal radio stations within the jurisdiction of the United

States, and establish a monopoly for the transmission of all government business.

The National Amateur Wireless Association was commended by the Secretary of the Navy, and its membership, amounting to 956, requested to hold themselves in readiness to cooperate with the government if required in time of need.

One of the most important adjuncts to the range of distinct signaling in both radiotelegraphy and radiotelephony was the audion detector and amplifier. This device, called also the ultraudion, is practically a highly exhausted bulb containing an electrically heated filament as a source of electrons, a metallic plate or wing facing this, and a metallic grid supported between filament and plate. By varying the potential of the grid, the electrons given off by the hot filament can be varied, and a considerable number of the particles thus controlled strike the plate and give up to it their charge. The ultraudion is a detector, an amplifier, and an oscillator for etheric radiations. A similar device produced during the year and used to a limited extent in radiotelephony was the pliotron. The $3\frac{1}{2}$ volt audion amplifier bulb, suitably excited, can generate alternating currents of from 60 to 1,000,000 periods per second when consuming only a few hundredths of one watt energy. In both radiotelephony and radiotelegraphy, the successful accomplishment of long distance communication was due to the construction of more powerful sending apparatus and more sensitive receivers.

An epoch-making event was the achievement, on September 29th, of transcontinental wireless telephony. On that date the wireless transmission of speech between Washington, D. C., and San Francisco, Cal., was satisfactorily accomplished. On October 21st wireless telephone messages sent out from Washington were received at the Eiffel Tower in Paris, and at the same time were heard distinctly at the wireless station at Honolulu, Hawaii. The apparatus used was developed by the engineers of the American Telephone and Telegraph and Western Electric companies, but on account of the existing patent situation, no details of the more important devices employed were made public. During the year the Lackawanna Railroad improved the apparatus developed by it in 1914 for wireless telephony between stations and moving trains, successfully communicating with a train more than 50 miles away. The United States navy was experimenting with wireless telephony and was understood to have secured satisfactory results at sea over longer distances than were formerly possible.

WISCONSIN. POPULATION. The estimated population of the State on July 31, 1915, was 2,473,533. The population in 1910 was 2,333,860.

AGRICULTURE. The acreage, production, and value of the principal crops, as estimated by the United States Department of Agriculture, in 1914-15, were as follows:

		Acreage	Prod. Bu.	Value
Corn	1915	1,775,000	40,825,000	\$27,761,000
	1914	1,725,000	69,862,000	45,410,000
Wheat	1915	205,000	4,662,000	4,429,000
	1914	184,000	3,511,000	3,511,000
Oats	1915	2,150,000	99,975,000	85,991,000
	1914	2,300,000	62,100,000	26,708,000
Rye	1915	420,000	7,770,000	6,760,000
	1914	412,000	6,798,000	6,186,000

		Acreage	Prod. Bu.	Value
Barley	1915	656,000	23,288,000	13,041,000
	1914	675,000	18,428,000	11,425,000
Potatoes	...1915	298,000	25,926,000	11,667,000
	1914	304,000	37,396,000	11,809,000
Hay	1915	2,576,000	a 4,508,000	44,629,000
	1914	2,550,000	4,462,000	41,497,000
Tobacco	1915	41,000	b 86,900,000	2,214,000
	1914	45,600	53,808,000	5,919,000

a Tons. b Pounds.

LIVE STOCK. The United States Department of Agriculture estimated that on Jan. 1, 1916, and Jan. 1, 1915, horses numbered 712,000 and 705,000, valued at \$88,288,000 and \$92,355,000; mules numbered 3000 and 3000, valued at \$360,000 and \$381,000; milch cows numbered 1,675,000 and 1,626,000, valued at \$92,125,000 and \$96,747,000; other cattle numbered 1,313,000 and 1,216,000, valued at \$33,088,000 and \$33,683,000; sheep numbered 664,000 and 781,000, valued at \$3,519,000 and \$3,905,000; swine numbered 2,142,000 and 2,255,000, valued at \$19,278,000 and \$27,060,000. The production of wool in 1915 and 1914 was 4,031,000 and 3,960,000 pounds respectively.

MINERAL PRODUCTION. Wisconsin ranks fourth among the States in the production of iron ore. There were produced in 1914 886,512 long tons, compared with the production in 1913 of 1,018,272. The marketed value of the product in 1914 was \$1,178,610, compared with a value of \$2,149,397 in 1913. The value of the total mineral production in 1914 was \$11,022,643, compared with \$12,452,480 in 1913.

TRANSPORTATION. The railway mileage on Dec. 31, 1915, was 7518. This was main track only. The total trackage of all kinds was 11,608. Lines having the longest mileage were the Chicago and Northwestern, 2168; Chicago, Milwaukee, and St. Paul, 1796; Minneapolis, St. Paul, and Sault Ste. Marie, 1351.

EDUCATION. The latest statistics available of the State are for the biennial period 1913-14. The school population of the State between the ages of 7 and 20 in 1914 was 782,246. The enrollment in the public schools was 440,103; of these 270,269 were enrolled in the county schools and 169,834 in city schools. The school houses numbered 18,018. There were employed 1692 male teachers and 13,839 female teachers. The total disbursements for support of the schools in 1913-14 were \$15,036,809.

FINANCE. The total receipts for the fiscal year 1915 amounted to \$19,431,931. The disbursements amounted to \$19,789,188. On July 1, 1914, there was a balance of \$4,300,854, and on July 1, 1915, of \$3,945,597. The State has no bonded debt.

CHARITIES AND CORRECTIONS. The charitable and correctional institutions include the State Hospital for the Insane at Mendota, the Northern Hospital for the Insane at Winnebago, School for the Deaf at Delavan, School for the Blind at Janesville, Industrial School for Boys at Waukesha, State Prison at Waupun, State Public School at Sparta, Home for the Feeble-minded at Chippewa Falls, State Reformatory at Green Bay, State Tuberculosis Sanatorium at Wales, Hospital for the Criminal Insane at Waupun, and Milwaukee Hospital for the Insane.

POLITICS AND GOVERNMENT. Under the operation of the eugenic law passed in 1914, 1400 fewer marriages were reported to the State Board of Health than in 1913. Elections held on April 6th showed a gain for no-license in 13 towns,

but license gained in 1. Thirty towns previously licensed remained under license, while 23 dry towns remained dry. The largest cities voting on the license question were Ashland, Superior, Beloit, and Madison, all of which voted for license. Measures providing for the submission of the question of a woman suffrage amendment to the people were defeated in the Legislature.

STATE GOVERNMENT. Governor, E. L. Phillip; Lieutenant-Governor, E. F. Dithmar; Secretary of State, John S. Donald; Treasurer, Henry Johnson; Adjutant-General, Orlando Holway; Attorney-General, W. C. Owen; Superintendent of Education, C. P. Cary; Commissioner of Agriculture, C. P. Norgard; Commissioner of Insurance, M. J. Cleary—all Republicans except Cary, Ind.

JUDICIARY. Supreme Court: Chief Justice, John B. Winslow; Associate Justices, William H. Timlin, R. G. Siebecker, A. J. Vinje, Rouje J. Marshall, J. C. Kerwin, John Barnes; Clerk, Arthur A. McLeod.

STATE LEGISLATURE:

	Senate	House	Joint Ballot
Republicans	21	63	84
Democrats	11	28	39
Social Democrats	1	8	9
Progressive	..	1	1
Republican majority..	9	26	35

WISCONSIN, UNIVERSITY OF. A State institution for higher education founded at Madison, Wis., in 1848. The total enrollment in all departments in the autumn of 1915 was 4848 for the regular full year, and 524 in the short courses. The faculty numbered 688, of whom 161 averaged half time. Resignations were received during the year of D. C. Munro, professor of history; J. G. D. Mack, professor of machine design; C. P. Norgard, associate professor of agronomy; J. G. Sanders, associate professor of economic entomology. New appointments include those of F. G. Callan, professor of steam and gas engineering; H. F. Wilson, professor of economic entomology; F. A. Aust, assistant professor of landscape design; C. S. Pendelton, assistant professor of English; J. D. Diehl, assistant professor of German; and W. J. Geib, assistant professor of soils. The university was made the residuary legatee of J. Stephens Stripp, on the death of certain beneficiaries, of an estate of about \$350,000. The total productive funds of the university at the end of the year June 30, 1915, amounted to \$783,662. The total estimated receipts amounted to \$765,014. The library contained 218,595 volumes.

WITTE, COUNT SERGIUS JULOVITCH. Russian statesman, died March 12, 1915. He was born in Tiflis, in 1849. His father was of a humble Dutch family that emigrated to Russia, but his mother was of ancient lineage. The boy received an excellent education. He graduated from the University of Odessa, and upon leaving the university began a business career. He entered the railroad service in a shipping department, and showing remarkable ability, was advanced with great rapidity. He attracted the attention of the government because of the unusual skill with which he moved army supplies during the Russo-Turkish War. He was in consequence called to Petrograd and promoted from one responsible position to another. In 1879 he became minister of

railways and communication. Shortly afterwards he was appointed minister of finance. He had in mind vast schemes for magnifying the wealth and greatness of Russia, and in developing his ideas he used almost tyrannically the immense power which was placed in his hands by Alexander III. He employed for his purposes every engine of the government. Two great ideas dominated his plans. One was the development of home manufactures, and the other was the extension of the railroad system of Russia. As a result of his plan for the first of these purposes, he made Russia actually a great manufacturing country, vastly increasing its wealth, and, as a result of his plan for the second, the Trans-Siberian Railway was built, and Russia undertook a career of railroad expansion, which was interrupted only by the great war in 1914. Carrying out the plan of Count Witte all private railways in the country were taken over by the state, bonds being given for the properties. At his suggestion also the government took charge of liquor traffic, and, until the sale of liquor was prohibited in 1914, Russia derived an immense revenue from this monopoly in spirits. His greatest achievement, however, was the establishment of the gold standard. These great efforts fell within Witte's tenure of the finance ministry, a period which represents his greatest power and most notable achievements. In 1903, through intrigues against him, he was removed from the post of minister of finance. In carrying out his plans, he had made bitter enemies, who influenced the Czar against him. Under these circumstances he left Russia for several years, and did not return until the Russo-Japanese War was in progress. His appointment as head of the peace commission at the conclusion of that war was the result of a general demand. In the negotiations for peace carried on at Portsmouth, N. H., Count Witte was the most conspicuous figure. Through his diplomacy he was able to end the war in a manner as advantageous to Russia as could have been expected. On his return home he was received as a hero, and was made a count. In 1905, after the Czar, in response to the demands of the people, had created a Duma and cabinet responsible in part to the Duma, Count Witte became president of the first Russian constitutional ministry. Shortly afterward, the necessity to use severity in quelling labor disturbances made Count Witte very unpopular, and the number of his enemies increased steadily. Pressure was again brought to bear upon the Czar for his removal, and on Dec. 7, 1905, Witte handed in his resignation. The resignation was accepted May 3, 1906, and Count Witte returned to private life permanently. In 1904 he married a Jewess, a very beautiful and clever woman. He was one of Russia's ablest men.

WOMAN MOVEMENT. The effects of the European war on the woman movement, felt to a certain extent already in the preceding year, became more conspicuous in both the belligerent and neutral countries in Europe, and made their influence felt to a greater extent in the United States in 1915. As in 1914, women in all parts of the civilized world took upon themselves a considerable share of the Red Cross and other charitable work connected with the war. Many American women distinguished themselves by the side of their European sisters in hospitals and relief work. Besides this participation of Amer-

ican women in the routine work behind the battlefields, leaders of American women and women's organizations in the United States endeavored throughout the year to establish the base of an understanding between the warring nations from which actual peace negotiations might be approached. The efforts of women in Europe and America in that direction, although fruitless for the present, were so widely discussed and so favorably received, that this active participation of women in the attempts to shape the political future of the world and the ready recognition of this participation by public opinion may be considered as the main achievement of the woman movement during the past year.

It was but natural that a conspicuous rôle in these attempts of preparing a way to mediation in the European war fell to the women of the United States. They, as the citizens of the most important country in the world standing aloof from the cataclysm of war, were primarily called upon to unite the efforts of women in other neutral and belligerent countries with their own in the agitation for peace in Europe. Already at the end of 1914 an "Emergency Federation of Peace Forces" was formed in Chicago with Jane Addams as chairman. The aims of the organization were, it was pointed out, "to secure the widest possible adoption by peace, civic, labor, religious, social, scientific, and other organizations of a minimum programme of constructive peace and to bring intelligent public opinion to bear to lead to such a settlement of the present world catastrophe as may insure permanent peace."

This preliminary group called a conference Jan. 10, 1915, in Washington, D. C., at which all important women's organizations were represented, for the purpose of concentrating pacifist opinion and enlisting American women in a movement to arouse the nations to respect the sacredness of human life and to abolish war. The organization that grew out of the conference constituted itself the Women's Peace Party, and included among its aims as set forth in its platform the immediate calling of a convention of neutral nations in the interest of early peace, limitation of armaments, nationalization of their manufacture, opposition to militarism, education of the youth in the ideals of peace, democratic control of foreign policies, extension of the franchise to women, support of the international idea in the Concert of Nations rather than the Balance of Power, international reorganization to eliminate war, an international police as a substitute for armies and navies, removal of the economic causes of war, and the appointment of a government commission to promote international peace. Miss Jane Addams was made chairman of the new party, and among those associated with her in an executive capacity are Mrs. Anna Garlin Spencer, Mrs. Henry Villard, Mrs. Louis F. Post, Mrs. John Jay White, Mrs. Lucia Ames Mead, Mrs. Glendower Evans, and Miss Sophonisba Breckinridge.

In April American women held, together with women representatives of the belligerent and neutral countries of Europe, a peace conference at The Hague—Jane Addams presiding—and passed finally a resolution that this meeting of women "of different nations, creeds, classes, and parties is united in expressing sympathy with the suffering of all, whatever their nationality, who are fighting for their country, or who are

laboring under the burden of the war. Since the mass of the peoples now warring believe themselves to be fighting not aggressively, but in self-defense, and for their national existence, it urges the governments of the world to put an end to this bloodshed and to begin peace-negotiations."

The conference did not meet the unqualified approval of women of the warring nations, a fact which only reflected the actual state of public opinion in those nations, as Miss Addams herself found later on a tour through the belligerent countries. On her return to the United States in the summer of 1915 Miss Addams had an interview with President Wilson, which was considered at the time not without a certain bearing on the repeatedly discussed idea of American mediation in the European war. But even if without immediate results, the peace demonstration of American and other women at The Hague in the spring of 1915 proved a remarkable step of the woman movement in its aspiration to a share in international as well as domestic politics, and in the shaping of the political future of the world. The foundation of a "World Union of Women" in Geneva in April, for the purpose of uniting women to prevent future wars proved another step in that direction, while in England a Woman's International League was organized, having as its object "to establish the principles of right rather than might, and coöperation rather than conflict in national and international affairs, and for this purpose to work for (1) the development of the ideals underlying modern democracy in the interests of constructive peace, and (2) the emancipation of women and the protection of their interests, including their admission to the Parliamentary franchise, their admission to national and international councils, and the establishment of their economic independence and legal freedom."

On July 4-7 an International Conference of Women Workers to prevent War and ensure permanent peace was held at San Francisco, almost all civilized nations being represented. Besides protests against war and proposals to ensure permanent peace, special demand was made "that women be permitted to share political rights and responsibilities both nationally and internationally." A great peace demonstration was held by Swedish women at Stockholm on June 27th. In Germany on April 20th an "Auslandsbund deutscher Frauen" was founded with the purpose of bringing women of German descent in foreign countries in contact with each other and furthering thereby the understandings of foreign nations.

The participation of some women prominent in the American woman movement in the so-called "Ford peace expedition" to Scandinavia and Holland in the later part of the year and the agitation of others to induce Congress to pass a law prohibiting the export of war munitions, and the participation of women in the "preparedness movement" in the United States may also be mentioned in this connection.

Besides these activities of a more political or pacifist character, American women followed with interest the new social problems with regard to the position and employment of women which were created through the progress and growing strain of the European war, especially in the belligerent countries—Turkey included—although these problems were substantially the

same in neutral countries like Holland and Switzerland as in the countries at war. The war has brought about in all the belligerent countries remarkable changes in the social position and economic functions of women, which have awakened the general public to the possibilities of new activities and a higher social status for women, and will undoubtedly have a permanent influence not only upon the activities of woman herself but upon the conception of the family and its relation to the state. In England it was urged that employment of women in the army commissariat would have prevented wastage of food. In Germany a women's organization, the "Nationaler Frauendienst," played an important rôle in the war-time economies of the nation, as well as in those of every household, which were resorted to to counterbalance the scarcity of certain foodstuffs. In the last named country the realization of the necessity of straining every nerve in a tremendous struggle favored the public discussion of the suggestion of a year of service for women in the domestic and social field, corresponding to the term of military service for men.

The draining of the belligerent countries of men for the continuation of the war led everywhere to increasing employment of women even in professions or occupations where men were formerly employed exclusively or at least in overwhelming majority. In England, for instance, according to a statement by the London School of Medicine for Women, the demand for women doctors exceeded the supply. Even the posts of house physicians and home surgeons in the hospitals, heretofore always held by men, were offered to women, and women were undertaking the practice of men who had gone to the front. In Germany post officials and even firemen in country towns were largely replaced by women. Similar conditions prevailed in France or Russia and even Holland, where men were drafted into the army to protect the frontier. In all belligerent countries women were engaged in increasing numbers in the manufacture of munitions; in England college girls were working in the hay fields, and in July over 10,000 women demanded the right to work for their country, whereas in Germany the Grand Duchess Louise of Baden sent to Emperor William an etching entitled "Silent Heroism," and portraying peasant women tilling the soil while the men were fighting at the front.

This growing realization of the importance of woman in national life found its expression partly in a greater readiness to admit women to positions of influence which were hitherto more or less withheld from them, partly in a greater consideration of the special needs of women for protection through social legislation. In England, for instance, it was considered as a course entirely without precedent that Queen Mary was called upon to fulfill the special official duties of the King during his illness in autumn, 1915. In the same way the appointment of a prominent suffragist leader, Miss Pressley Smith, as assistant secretary of the British legation at Christiania, was considered as a departure in British policy and a tribute to the work of British women in the war. In Germany the right of women teachers to marry was demanded, and legislation was urged which would recognize legally woman as the head of the family, which position she would be holding economically in

the not infrequent cases where her maimed husband had lost—either partially or completely—his earning power. In Austria actual legal progress was made in that direction by the easier admission of women as guardians. In Norway a bill providing for mothers' pensions was passed. In Turkey demands were made urging the foundation of a university for women.

In the United States important progress was also made in the struggle for the enfranchisement of women. The Women's City Club of Boston passed its first year in its new clubhouse on Beacon Street, and fulfilled the highest expectation of its organizers as a democratic centre of social and civic activity for women. In New York a Woman's City Club was organized in July by a group of a hundred women to work for better political conditions, and especially for legislation relating to women and children.

The movement for trade union organization among women made considerable advances throughout the year (see TRADE UNIONS). The Women's Trade Union League held its fifth Biennial Convention in New York on June 12th. The League reaffirmed its legislative programme of two years ago and made many additions. It asked, among other things, uniform State laws, the minimum wage, an eight-hour day, restriction of child labor, study and prevention of occupational diseases, abolition of sweat shop labor, one day's rest in seven, regulation of prison labor, abolition of private detective agencies, which "thrive upon strikes and are used to break them." The two outstanding questions of the convention were peace and woman suffrage.

In the United States important steps were taken in all parts of the country toward opening new occupations for women, witness the following facts: the election of a woman, Miss Reah Whitehead, as criminal judge in Seattle; the appointment of the first woman Justice of the Peace in Montana; the passage of bills in New York and New Jersey authorizing the appointment of women as police officers; the organization of a national society of police-women in Baltimore on May 20th; the appointment of a woman as State Senator in Oregon to fill a vacancy; the election of a woman State Senator in Arizona; the appointment of three women physicians to the regular staff of the Cumberland Street Hospital in Brooklyn; the appointment to Bellevue of a woman graduate of Cornell Medical School, Miss Eugenie Ingerman, who had passed the hospital examination at the head of the list; the appointment of a woman as food inspector, and of another as a member of the Advisory Council of the New York Department of Health; and the appointment of two women as judges of the Juvenile Court in St. Louis. The selection of women in other cities for such offices as commissioner of public welfare, deputy sheriff, and members of boards of education and of health are only the more conspicuous landmarks in the advance of women into the general field of social activity and labor.

See also WOMAN SUFFRAGE.

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WOMAN'S CHRISTIAN TEMPERANCE UNION, NATIONAL. An organization formed in 1874 for abolishing the liquor traffic. The Forty-second Annual Convention of the union was held at Seattle, Wash., on Oct. 9-14, 1915. In 1915 there was a gain of 35,771 new mem-

bers for the organization. Its receipts were \$112,251 and expenditures, \$94,600. Through the various departments 48,332,168 pages of literature were distributed, and of this about 35,000,000 pages were temperance literature. The official publications of the union are *The Union Signal*, of which Miss Anna A. Gordon is editor-in-chief, and *The Young Crusader*, of which Mrs. Ella A. Boole is editor-in-chief, and Miss Windsor Grow, managing editor. National headquarters are maintained at Evanston, Ill. The officers for 1915-16 are as follows: President, Miss Anna A. Gordon, Evanston, Ill.; vice-president-at-large, Mrs. Ella A. Boole, 1429 Avenue H, Brooklyn, N. Y.; corresponding secretary, Mrs. Frances P. Parks, Evanston, Ill.; recording secretary, Mrs. Elizabeth Preston Anderson, Fargo, N. D.; assistant recording secretary, Mrs. Sara H. Hodge, Lincoln, Va.; treasurer, Mrs. Margaret C. Munns, Evanston, Ill.

WOMAN SUFFRAGE. FOREIGN COUNTRIES. Although in the belligerent countries no actual progress has been made in the direction of obtaining the parliamentary vote for women, the position of woman has been greatly strengthened by the growing realization under the stress of war time of the importance of woman as an economic factor. This recognition seems evidently to improve the chances of the enfranchisement of women in various European countries after peace is once restored. In England the militant suffragists kept the truce entered at the outbreak of the war, and postponed the active prosecution of their demands until the return of peace. In Germany women sent a petition for the ballot to the Reichstag in which they said: "Women render, collectively, services to the state which are indispensable to its existence; fairness demands that the state should give them collective rights." In France a special commission appointed to investigate the question of the enfranchisement of women recommended that the full suffrage be extended to women as rapidly as may be thought feasible, and that the municipal suffrage be granted to them at once. On April 23rd the Danish Diet adopted an amendment to the constitution giving full suffrage to women, and also the right to election to the Diet. It was passed by the new Diet which was elected in May. Before that, tax-paying women had the right to vote in Denmark. The new constitution, which confers the suffrage on women and abolishes the special electoral privileges heretofore exercised by the wealthier classes, was unanimously passed on the anniversary of the signing of the first constitution by Frederick VII in 1849. In Norway, where women voted for the first time in October, there were 170,000 new electors on the rolls. On November 1st the Dutch government introduced a bill which proposes extension of the right to vote to all male and female citizens who have reached the age of 23. The Canadian provinces of Manitoba and Alberta have drafted government bills giving women the ballot. Saskatchewan is expected to follow their example shortly. In South Africa at the recent municipal elections in Maritzburg, the first since women received the municipal franchise, 76 per cent of the women voters polled, as compared with 63 per cent of the men. In Iceland full suffrage was granted to women during the past year. They had

enjoyed partial suffrage for some time, and since 1902 one-fourth of the members of the council of the capital city had been women. The first election at which South African women could use their municipal franchise took place on November 10th. The prospects of women obtaining the parliamentary franchise in South Africa are considered good. The new government of China stands pledged to woman suffrage, and women already vote in one province of China. "Since of the 400,000,000 people of China half are women," says a manifesto issued by the Chinese women's political movement, asking for a restoration of the Chinese monarchy, "it is in behalf of these 200,000,000 that we are appealing. According to the constitutional compact the sovereignty of the country is vested in the people of the whole country. The people of the whole country' naturally means the people of both sexes." In connection with the various international peace congresses organized by women during 1915, demands were also made that the women be permitted to share political rights and responsibilities both nationally and internationally.

UNITED STATES. The National Woman Suffrage Amendment Resolution failed on January 12th to pass the House of Representatives by a vote of 174 ayes to 204 noes. The expressed opposition was for the most part not against the enfranchisement of women, but against Federal action. The State rights argument was kept in the foreground throughout the debate. The vote by parties stood—for the resolution: 86 Democrats, 72 Republicans, 12 Progressive Republicans, 1 Independent; against it—171 Democrats and 33 Republicans. Seventy-eight more votes would have given the amendment the necessary two-thirds majority. Throughout summer and fall a well-organized and energetic campaign was conducted in the States of Massachusetts, New York, Pennsylvania, and New Jersey to obtain the passage of woman suffrage in the State elections. President Wilson voted for suffrage on October 19th in New Jersey. In New York 50,000 women marched in parade on October 23rd before hundreds of thousands of spectators. At the November elections close to a million votes were cast for equal suffrage. It is stated that only the full force of the machine politicians in Philadelphia prevented the State of Pennsylvania from leading the East in enfranchising women. The results of the ballot were: in New Jersey, 133,282 for woman suffrage, 184,390 against, majority against, 51,108; in Massachusetts, 163,406 for, 295,489 against, majority against, 137,647; in New York, 544,457 for, 732,770 against, majority against, 184,242; in Pennsylvania, 385,348 for, 411,034 against, majority against, 55,946. The enthusiasm of the suffragists was unabated and a great mass meeting at Cooper Union in New York pledged \$100,000 for a new campaign.

On December 6th President Wilson and about a hundred members of Congress received large delegations of suffragists from the Congressional Union after an impressive parade through Pennsylvania Avenue. In his reply the President regretted that it was too late to consider the wishes of the delegation in his message. On the same day resolutions were introduced in both houses of Congress for a nation-wide amendment enfranchising women. When the House assembled, Representatives Mondell of Wyoming

(Republican), Raker of California (Democrat), and Meyer London of New York (Socialist) presented identical resolutions for equal suffrage throughout the country. The next day, when the Senate began to receive bills, Senator Sutherland of Utah (Republican) introduced the suffrage amendment for the Congressional Union, and was followed by Senator Thomas of Colorado (Democrat), who introduced the same measure for the National American Woman Suffrage Association. At the annual convention of the National American Woman Suffrage Association held during the middle of December at Washington, Dr. Anna Howard Shaw resigned as president of the Association, and Mrs. Carrie Chapman Catt was elected instead. In her final address Dr. Shaw said: "That woman's vote would secure better legislation for the home and children against all the corrupting forces of vested interests and vice which prosper upon their degradation and the exploitation of children, is shown by the laws which have been secured by women in States where they already vote and which are advocated in those States where they do not vote."

Eleven States have now granted full suffrage for woman. These States are: Wyoming (1869), Colorado (1893), Utah (1896), Washington (1910), California (1911), Oregon (1912), Kansas (1912), Arizona (1912), Alaska (1913), Montana (1914), and Nevada (1914). In 1914 Illinois granted presidential and municipal suffrage. In Alabama the woman suffrage measure was defeated in the House by a vote of 52 to 43. A three-fifths majority is needed for passage. In Arkansas it passed the House by 51 to 18 and the Senate by 23 to 12, but was prevented from going to the voters by a law which says that only three amendments may be submitted at once. In Vermont a bill for partial woman suffrage passed the Senate by a vote of 29 to 10, but was defeated in the House by 129 to 100. In Indiana a bill for partial suffrage passed the Senate 37 to 3, but the House refused to bring it out of committee. In Nebraska the House defeated a municipal suffrage bill 54 to 40. In North Carolina the House defeated the suffrage amendment 68 to 39. In Minnesota the Senate defeated the suffrage amendment 34 to 33. In Delaware the House defeated the suffrage amendment 22 to 8, and the Senate 16 to 11. In North Dakota the Senate passed the amendment 31 to 14, but reconsidered and tabled it 26 to 21. In Texas the House voted 90 to 32 in favor of an amendment which failed because a two-thirds vote was necessary. In Florida the House defeated the suffrage amendment, although there were 31 votes for and 24 against, since a three-fifths vote was required to pass the amendment. In Wisconsin the Senate defeated the suffrage amendment 49 to 41. In Missouri it passed the House 88 to 40, but did not come up for consideration in the Senate. In Maine a two-thirds rule prevented the passage of a suffrage amendment in the State where the vote in the Senate was 26 in favor, 4 in opposition, and in the House 88 opposed to 59 in favor. In Michigan the women tax payers were given the right to vote for charter amendments and two propositions involving the direct expenditure of money. In New Hampshire the bill for municipal suffrage for women was defeated in the House by 230 to 121. In Connecticut the amendment was defeated in the House by 106 to 124. In New

Mexico, Oklahoma, South Carolina, and Ohio no action was taken. In Rhode Island the bill for presidential suffrage was defeated in the House 65 to 31. In Georgia the suffrage bill was killed in committees of the House and Senate. Five Legislatures, those in Kentucky, Maryland, Louisiana, Mississippi, and Virginia, were not in session this year.

See also WOMAN MOVEMENT.

Bibliography. Frances M. Björkman, *Woman Suffrage* (New York, 1915); Mary P. Jacobi, *Common Sense Applied to Woman Suffrage* (New York, 1915); W. Parker, *The Fundamental Error of Woman Suffrage* (New York, 1915); Anna Howard Shaw and Elizabeth Jordan, *The Story of a Pioneer* (New York, 1915).

WOMEN AND THE WAR. See WOMAN MOVEMENT; and RED CROSS.

WOMEN IN INDUSTRY. The interest in the industrial aspects of woman's position in modern society was, as in preceding years, manifested in several concrete ways. The legislation and judicial decisions relating to hours and conditions of employment are set forth below and in the articles on CHILD LABOR and on MINIMUM WAGE. In these same articles also will be found summaries of various investigations of the wages, ages, and nationalities of working women. The new movement for the special care of working mothers, especially widows, with minor children is treated under PENSIONS FOR MOTHERS.

NEW EMPLOYMENTS. The year was notable for the extension of women's industrial activities, especially in Europe; but various special cases elsewhere are of significance. The Cambridge Law School for Women was organized in affiliation with Harvard University; and it was noted that attendance of women at medical schools was increasing. Paterson, N. J., appointed a woman as dance hall censor; Los Angeles had a woman as acting mayor; Suffolk County, N. Y., had a woman deputy sheriff. In South Australia women justices were appointed. In Europe the war required the extension of women's activities in many directions. In France women aviators appeared; in Russia women replaced men on Volga steamers; in England they took up work on railways, street cars, and farms, and in munitions and other factories; in Germany, France, and Italy a similar movement was marked. See also AGRICULTURE.

THE NATIONAL WOMEN'S TRADE UNION LEAGUE held its 5th biennial convention in 1916. This organization is neither a trade union nor a federation of unions, but has for its purpose the fostering of trade organizations among working women. Emphasis is laid upon the organization of the humbler and more exploited ranks of workers. The sentiment of the majority at the convention was favorable to minimum-wage legislation and a resolution was passed committing the league to its support. The convention decided to change the name of the Training School for Organizers started in Chicago in 1914 to the Training School for Active Workers in the Labor Movement. Reports were made by the committees on organization, education, unemployment, legislation, and resolutions. Summer vocational courses were suggested in view of the summer slack season in many trades. In eight years the convention shows an increase from 8 to 91 delegates.

CALIFORNIA EIGHT-HOUR LAW. Two decisions

were handed down by the Supreme Court of the United States on the California eight-hour law for women. In one case the employer of the Glenwood Hotel was convicted for employing a woman more than eight hours; and in the other the trustees of the Samuel Merritt Hospital of Alameda and one of their employees sought to restrain the enforcement of the amended act. Both parties raised objections under the legal principles of freedom of contract and equal protection of the laws. On February 23rd the Court handed down two unanimous decisions upholding the validity of the law, which prescribes as short a workday as any yet enacted for women and includes a larger number of occupations than any similar statute. In both cases, the responsibility for deciding the need, expediency, or wisdom of the law is with emphasis held to be the function and duty of the Legislature, the Court limiting itself to considering whether in view of the underlying facts in each case, the Legislature has acted arbitrarily or unreasonably. As in the Oregon and Illinois cases of earlier years, Louis D. Brandeis of Boston coöperated with the State's attorneys. In the course of the opinion Justice Hughes pointed out: "The liberty of contract guaranteed by the Constitution is freedom from arbitrary restraint and is not immunity from reasonable regulation to safeguard the public interest. Upon this point the recent decisions of this Court upholding other statutes limiting the hours of labor of women must be regarded as decisive." This decision shows the adoption of a "rule of reason" as the basis for such laws. It opens the way for a scientific study of all occupations in which medical investigation may well show that eight hours daily exposure is in many cases too great a health risk.

LEGISLATION. Labor laws for women were enacted as follows: Kansas passed maximum-hour and minimum-wage laws; Massachusetts legislated to prohibit the working of women and children overtime for the purpose of making up time lost on a legal holiday; Maine enacted a 9-hour per day, 54-hour per week law for women and boys under 16 working in mills, factories, and laundries, but canneries were excepted; Arkansas regulated the employment of women by establishing a 9-hour day, and 54-hour week, forbidding night work below age 18, and establishing a minimum wage; Nebraska provided a 9-hour law for women except in cities of 5000 or more; North Carolina limited hours of women and minors in factories to 60 hours a week; Vermont required seats for female employees in all places of employment; Wyoming fixed hours of labor at 10 per day within 12 consecutive hours, with a maximum of 56 hours per week, and seats were required for all females under 18. The Oregon Industrial Welfare Commission has published an order providing for issuance of emergency overtime permits in canning and packing industry for six weeks in a year; wages are to be not less than 25 cents an hour and are not to be included in the minimum wage; the weekly time and pay roll of every woman who has worked more than the prescribed 54 hours a week are to be furnished the commission. Delaware established an unpaid labor commission to have charge of women-and-child labor inspectors. Ohio made a State grant to the Cleveland Girls' Bureau of \$2500 a year for two years beginning July 1, 1915, as evidence of

its recognition of the value of vocational guidance.

Thirty-two States and the District of Columbia now limit the working week of females to 60 hours or less; 2 have a 63-hour week; 5 have a 10-hour day with no restriction for the hours per week and 9 have failed to enact legislation on the subject. The 10-hour day is rapidly being reduced. An 8-hour day has been established in Arizona, California, Colorado, Washington, and Wyoming, as well as the District of Columbia; while Oregon, Minnesota, Missouri, Nebraska, New York, and Utah have 9-hour schedules. Idaho and Montana have a 9-hour day but no restriction for hours per week.

SWITZERLAND. The Swiss factory acts of 1877 amended in 1905 were repealed in 1915 and superseded by a new act which, among other things, dealt with the employment of women. Night and Sunday work were prohibited. Women must be granted a night's rest of at least 11 consecutive hours, including the period 10 p. m. to 5 a. m. This period may be exceptionally reduced to 10 hours but not generally for more than 60 days in the year; yet when the working of perishable materials is involved the exception may be extended for 140 days in the year. Exclusion from work in factories for 6 to 8 weeks following confinement is provided.

WOMEN'S CLUBS, GENERAL FEDERATION OF. A body first organized in March, 1889, in New York City. Its membership consists of Women's Clubs, State Federations, Territorial Federations, and kindred organizations. The total number of clubs admitted to membership is about 2000. The Twelfth Biennial Convention was held at Chicago, Ill., on June 9-19, 1914. The officers for 1914-16 are the following: President, Mrs. Percy V. Pennybacker, 2606 Whitis Avenue, Austin, Tex.; first vice-president, Mrs. Samuel B. Sneath, 211 Monroe Street, Tiffin, Ohio; second vice-president, Miss Georgie A. Bacon, 39 Dean Street, Worcester, Mass.; recording secretary, Mrs. Harry L. Keefe, Walthill, Neb.; corresponding secretary, Mrs. Eugene Reilley, 508 Park Avenue, Charlotte, N. C.; treasurer, Mrs. William B. Williams, Lapeer, Mich.; auditor, Mrs. Charles H. McMahon, 22 Caithness Apartments, Salt Lake City, Utah.

WOODBURY, URBAN ANDRÉ. American public official, former Governor of Vermont, died April 15, 1915. He was born in Acworth, N. H., in 1838, and graduated from the University of Vermont in 1859. In 1861 he enlisted in the Second Vermont Volunteers, and he served through the war. His war experience cost him his right arm; he was taken prisoner in the first battle of Bull Run; was paroled in the same year; and in 1862 was appointed captain in the Eleventh Vermont Volunteers. He was elected mayor of Burlington, Vermont, in 1885; Lieutenant-Governor of the State in 1880; and Governor in 1894.

WOODRUFF, CHARLES EDWARD. American army medical officer, died June 13, 1915. He was born in Philadelphia in 1860, and graduated from the United States Naval Academy in 1883. In the same year he was appointed professor of higher mathematics in the Reading High School. He studied medicine at Jefferson Medical College, graduating in 1884, and in the same year was appointed assistant surgeon in the United States navy, where he rose through various grades until he was appointed lieutenant-colonel,

retiring in 1913. He served in the Spanish-American War, in expeditions to the Philippine Islands, and in the Philippine Insurrection of 1902. He was awarded two medals for war service. Dr. Woodruff was a prime authority on military sanitation. He was the author of *Effects of Tropical Light on White Men* (1905); *The Expansion of Races* (1909); and of over 75 monographs chiefly on medical and military subjects.

WOOL. See STOCK RAISING AND MEAT PRODUCTION.

WORKINGMEN'S INSURANCE. See UNEMPLOYMENT; and WORKMEN'S COMPENSATION.

WORKMEN'S COMPENSATION. The movement begun a few years ago to replace employer's liability laws by the system of definite compensation for accidents without litigation has swept in a few years over the entire United States. Between 1910 and 1915, 23 States enacted compensation laws, while to this number 8 more were added during 1915. There were thus 31 States and 2 Territories with compensation laws; aside from 10 Southeastern States the only States without compensation laws are Idaho, North and South Dakota, Arkansas, Missouri, New Mexico, and Utah. Nearly all of these laws include public employees as well as private, while the Federal statute and the Canal Zone order applied either partly or exclusively to public employees. In general these laws provide either for compensation or for insurance and either type of law may be elective or compulsory. Thus elective compensation is provided in the following States: Alaska, Colorado, Connecticut, Illinois, Indiana, Iowa, Kansas, Louisiana, Maine, Michigan, Minnesota, Montana, Nebraska, New Hampshire, New Jersey, Pennsylvania, Rhode Island, Vermont, and Wisconsin; compulsory compensation is provided in: Arizona, California, Canal Zone, Hawaii, Maryland, New York, Oklahoma, and United States; elective insurance laws have been enacted in: Massachusetts, Nevada, Oregon, Texas, and West Virginia; while compulsory insurance laws exist in: Ohio, Washington, and Wyoming.

LEGISLATION. Missouri's third commission presented bills which failed to pass, and Utah created a commission of investigation. Hawaii enacted a compulsory law applicable to all industries and the public service with maximum benefit of \$5000. New laws were also enacted in the following States: Indiana, Maine, Montana, Oklahoma, Pennsylvania, Rhode Island, Vermont, and Wyoming. In addition significant modifications of previous laws were made in Colorado, Connecticut, Michigan, Minnesota, New York, Washington, and West Virginia. The standard of compensation in case of total disability in the new laws is 50 per cent of wages for 500 weeks. Some laws prescribed a maximum of \$5 or \$10 per week while others prescribed a total maximum of \$3000 to \$4000.

INDUSTRIAL ACCIDENTS. The enactment of these laws has naturally resulted in perfection of statistical information regarding industrial accidents. Thus Frederick L. Hoffman in *The Bulletin of the United States Bureau of Labor Statistics No. 157* estimated the number of fatal industrial accidents among American wage-earners conservatively at 35,000 for the year 1913; while injuries resulting in disability for more than four weeks numbered approximately 700,-

000. The fatality rate or the number of fatal injuries per thousand employees was found to range from 4.00 for metal mining, 3.50 for coal mining, 3.00 for fisheries and for navigation, lumbering, building, and street railway employees to general manufacturing where the rate was .25. The hazardous nature of some American trades is revealed by the fact that the fatality rate of coal mining in the United States during five years averaged 3.71 per thousand employees, while in the United Kingdom it was only 1.36, in Belgium 1.02, in Prussia, 2.25, and in Austria 1.15. The Bureau of Labor Statistics from a study of 10,000 accidents in the iron and steel industry involving disability of one day or more found that within the first week 41.2 per cent of disabilities had terminated, within two weeks 59.8 per cent, within four weeks 77.7 per cent, and within 13 weeks 93.1 per cent.

EXPERIENCE UNDER VARIOUS LAWS. The Massachusetts Insurance Department prepared a report showing the operations under the compensation insurance system in that State for all occupation classifications wherein payrolls of not less than \$500,000 were reported. The total audited payrolls upon which the premiums were based amounted to \$823,183,000. The total losses amounted to \$2,873,000, of which \$871,600 were for death and specified injuries, \$1,352,000 for weekly indemnity, and \$650,000 for medical services. In Ohio during 1914 more than 58,000 claims were disposed of; the State insurance fund received as premiums over \$2,900,000; and paid out for compensation, medical, surgical, hospital, and nursing services, medicines, and funeral expenses over \$1,229,000.

The New York State Commission reported that during the first seven months of the operation of the new law, or from July 1, 1914, to Jan. 31, 1915, 130,000 notices of injury were filed; 22,221 claims for compensation, or 17 per cent of the injuries, were made. This small percentage was due to the fact that compensation is allowed only for injuries resulting in disability of two weeks or more. There were allowed 18,930 claims, involving total compensation of \$1,577,000. The legal bureau of the commission considered 657 cases on appeal. On January 1st the State insurance fund reported 7119 policies in force with semi-annual premiums amounting to \$692,600.

NEW JERSEY. That the tendency is toward the more comprehensive and more compulsory type of law was shown by the report of a special Employers' Liability Commission appointed to observe the operation of the compensation law in New Jersey, which is of the elective compensation type. This commission recommended the submission to popular vote of a constitutional amendment authorizing a compulsory law including compulsory insurance. They pointed out that the existing law does not insure the payment of compensation in case the employer becomes insolvent. They recommended the creation of a State insurance fund to be placed on a sound actuarial basis. They recommended also that occupational diseases be brought within the scope of the law and that the various benefits under the law, such as the wage basis for compensation, the length of time during which compensation should be paid, the compensations for specific injuries, and other provisions be considerably liberalized.

INTERNATIONAL ASSOCIATION OF INDUSTRIAL

ACCIDENT BOARDS AND COMMISSIONS. This is an association organized "to bring into closer relation with one another the various boards and commissions administering compensation laws of the United States and to effect so far as possible unanimity in the administration of such laws and to encourage and give effect to all measures looking toward the prevention of accidents and the safeguarding of plants and machinery. This body held a meeting at Chicago in January at which a Committee on Statistics and Compensation Insurance Cost was appointed. At a subsequent meeting in Seattle, September 30th to October 2nd, the report of this committee was considered. Representatives of 12 States and the Province of Ontario were in attendance. The report included a most elaborate and thorough study of the classification of industries with reference to accidents and compensation insurance. Some 1500 different classifications were included under nearly 300 "groups" which in turn were subordinated to schedules; these schedules in turn were brought under 7 primary "divisions." The divisions were agricultural; mining and quarrying; manufacturing; construction; transportation and public utilities; trade; service. This was believed to be an important step in the development of the science of accident compensation. Columbus, Ohio, was selected as the place for the next session in April, 1916.

THE NATIONAL SAFETY COUNCIL met in 4th annual convention at Philadelphia, October 19-21. Representatives were present of mining, railroads, public utilities, foundries, laundries, wood-working establishments, and cement, paper, and textile mills. Each of these groups held sectional meetings to discuss their own technical problems. There were in addition section meetings on safeguarding machinery and on the medical aspects of industrial accidents. Much emphasis was laid on the connection between the consumption of liquor and the number and seriousness of accidents. On account of the widespread compensation legislation the necessity of thoroughgoing legislation to prevent accidents and the greatest possible extension of the safety movement was emphasized. In the medical section the value of physical examinations and other methods of weeding out the unfit and subnormal was emphasized. It was believed that in this matter the coöperation of health departments would reduce the opposition of workmen to such policies. From the practical point of view it was generally agreed that the most effective means of extending the safety movement was to convince business managers of the financial advantages accruing from the adoption of safety devices.

WORLD PEACE FOUNDATION. See INTERNATIONAL PEACE AND ARBITRATION.

WRESTLING. The winners of the United States national championships held at San Francisco were: 108-pound class, R. Goudie, Ohio; 115-pound class, F. Glahe, Spokane, Wash.; 125-pound class, S. Vorres, Chicago, Ill.; 135-pound class, O. Runchey, Seattle; 145-pound class, D. Burns, Spokane; 158-pound class, B. Reuben, Chicago; 175-pound class, E. Caddock, Chicago; heavyweight class, E. Caddock, Chicago.

Cornell for the third year in succession won the intercollegiate championship, with Lehigh second, and Pennsylvania third. The winners of the various bouts were: 115-pound class,

Culbertson, Cornell; 125-pound class, Martin, Lehigh; 135-pound class, Post, Cornell; 145-pound class, Thomas, Lehigh; 175-pound class, Pendleton, Columbia; heavyweight class, Dorizas, Pennsylvania.

The feature of the year in professional wrestling circles was the tournament conducted at the Manhattan Opera House, New York City. All the prominent mat-men of the world met there in a series of bouts that attracted large crowds and did much to bring the sport into popular favor.

WYOMING. POPULATION. According to the State census taken in 1915 the population of Wyoming in that year was 141,705. The population in 1910 was 145,965.

AGRICULTURE. The acreage, production, and value of the principal crops, as estimated by the United States Department of Agriculture, in 1914-15, were as follows:

		Acreage	Prod. Bu.	Value
Corn	1915	25,000	625,000	\$419,000
	1914	21,000	525,000	368,000
Wheat	1915	125,000	3,315,000	2,586,000
	1914	100,000	2,290,000	2,088,000
Oats	1915	227,000	9,534,000	4,100,000
	1914	225,000	7,875,000	3,780,000
Rye	1915	9,000	180,000	162,000
	1914	5,000	85,000	69,000
Barley	1915	17,000	612,000	387,000
	1914	16,000	528,000	388,000
Potatoes	1915	16,000	2,400,000	1,440,000
	1914	17,000	1,620,000	1,134,000
Hay	1915	550,000 a	1,210,000	9,438,000
	1914	500,000	1,150,000	8,625,000

a Tons.

LIVE STOCK. The United States Department of Agriculture estimated that on Jan. 1, 1916, and Jan. 1, 1915, horses numbered 180,000 and 176,000, valued at \$14,760,000 and \$13,904,000; mules numbered 2000 and 2000, valued at \$198,000 and \$202,000; milch cows numbered 50,000 and 46,000, valued at \$4,025,000 and \$3,588,000; other cattle numbered 703,000 and 628,000, valued at \$37,048,000 and \$33,472,000; sheep numbered 4,338,000 and 4,427,000, valued at \$9,563,000 and \$7,704,000; swine numbered 70,000 and 64,000, valued at \$658,000 and \$730,000. The production of wool in 1915 and 1914 was 28,476,000 and 29,040,000 pounds respectively.

MINERAL PRODUCTION. The quantity of coal mined in the State in 1914 was 6,475,293 short tons, valued at \$10,033,747. This was a decrease of 917,773 tons in quantity and \$1,476,398 in value, compared with 1913. The decrease is attributed to a lessened demand for coal for domestic uses, on account of the unusually mild winter throughout the year, and to the smaller amount required by the railroads. The total production of gold in the State in 1914 was \$5006, compared with \$24,084 in 1913. There is practically no production of silver. The iron ore mined in the State in 1914 amounted to 366,962 long tons, compared with 537,111 long tons in 1913. In 1914 Wyoming lost sixth place in the production of iron ore, being surpassed in production by Pennsylvania and Virginia. It now ranks eighth. The value of the total mineral production in 1914 was \$12,417,752 compared with \$13,682,091 in 1913.

FINANCE. The report of the State treasurer for the biennial period 1913-14 shows a cash balance on Oct. 1, 1912, of \$1,179,672. The receipts for the period were \$2,643,268, and the

disbursements \$2,331,459, leaving cash on hand Sept. 30, 1914, of \$1,491,482.

EDUCATION. The total number of pupils of school age 6 to 21 in 1914 was 37,695. There were enrolled in the public schools 2930. The teachers numbered 1488, of whom 1300 were females, and 188 were male.

CHARITIES AND CORRECTIONS. The charitable and correctional institutions include State Hospital for the Insane at Evanston, Wyoming State Penitentiary at Rawlins, Wyoming Soldiers' and Sailors' Home at Buffalo, Big Horn Hot Spring Reserve at Thermopolis, Wyoming General Hospitals at Sheridan, Rock Spring, and Casper, the Wyoming School for Defectives at Lander, and Wyoming Industrial School at Warland.

TRANSPORTATION. The railway mileage of the State in 1914 was about 2000 miles. The Union Pacific in 1915 constructed about 83 miles of new track. There was no construction by the Chicago, Burlington, and Quincy.

POLITICS AND GOVERNMENT. The Legislature passed a measure placing wife and husband on equal footing in regard to ownership of property. It also enacted an eight-hour law for women, and a workmen's compensation law. February 27th, Governor Kendrick signed the widowed mothers' pension bill passed by the Legislature.

STATE GOVERNMENT. Governor, John B. Kendrick; Secretary of State, Frank L. Houx; Treasurer, Herman B. Gates; Auditor and Commissioner of Insurance, Robert B. Forsyth; Adjutant-General, George M. Sliney; Attorney-General, D. A. Preston; Superintendent of Education, Edith K. O. Clark; Kendrick, Houx, and Preston Democrats, others Republicans.

JUDICIARY. Supreme Court: Chief Justice, Charles N. Potter; Associate Justices, Cyrus Beard, R. H. Scott; Clerk, W. H. Kelly.

STATE LEGISLATURE:

	<i>Senate</i>	<i>House</i>	<i>Joint Ballot</i>
Republicans	18	42	60
Democrats	9	15	24
Republican majority..	9	27	36

WYOMING, UNIVERSITY OF. A State institution for higher education founded at Laramie, Wyo., in 1886. The total enrollment in all departments in 1914-15 was 508. There were no notable changes in the faculty during the year, and no noteworthy benefactions were received. The institution is supported almost entirely by legislative appropriations. The productive funds amounted to about \$70,000, the annual income to about \$232,000. The library contained approximately 35,000 volumes. The president was Clyde Augustus Duniway, Ph.D., LL.D.

X-RAYS. See **CHEMISTRY, GENERAL PROGRESS OF; PHYSICS; ROENTGEN RAYS; THORIUM.**

YACHTING. No race for the America's Cup was held in 1915 although yachtsmen in the United States, hoping against hope, thought it possible for a time that the *Shamrock IV* might be lured from its quarters in Brooklyn and at least take part in a few trial spins. This being found impossible the New York Yacht Club did the next best thing and arranged a series of races between the *Resolute* and the *Vanitie* in order to ascertain which of the two was best

fitted to meet Sir Thomas Lipton's challenger, should a contest take place in 1916.

Sixteen races were sailed between the two American yachts, of which the *Resolute* won 12 and the *Vanitie* 4. In 1914 the *Resolute* had captured 13 races as against 6 for the *Vanitie*, so that out of 35 starts, the former had emerged victor in 25.

The New York Yacht Club "fifties" sailed in 26 races, the honors being fairly evenly divided between Com. George Baker, jr.'s *Ventura*, winner of the King's Cup off Marblehead; W. E. Dodge's *Samuri*, winner of the Astor Cup for sloops off Newport; J. P. Morgan's *Grayling*, and Harry Payne Whitney's *Barbara*.

Among the 10-year-old "thirties," the *Okee*, owned by Com. J. A. Mahlstedt of the New Rochelle Yacht Club, easily proved her superiority. She started in 27 races, winning 10 firsts, 9 seconds, and 2 thirds. In the handicap class, comprising 35 yachts, A. W. Lockwood's *Carolina* made the best showing. Com. Robert E. Tod's schooner *Katoura* won both the Cape May and the Brenton Reef challenge cups.

In motor-boating the mile-a-minute boat made its appearance, Com. James A. Pugh's 40-foot hydroplane traveling at the rate of 61 miles an hour for 20 of the 30 miles and at an average of 54 $\frac{1}{10}$ miles an hour for the entire distance.

The winners of the principal races held under the auspices of the American Power Boat Association were: Gold Challenge Cup, *Miss Detroit*; mile championship, *Tech, Jr.*; New York to Albany, *Flyaway III*; 100-mile Block Island race, *Cero*.

YALE UNIVERSITY. The total enrollment in all the departments in the autumn of 1915 was 3003. The instructors numbered 480. During the year a department of business administration was organized. Prof. John Zelaney was appointed professor of physics. For the record of the gifts received during the year see **GIFTS AND BEQUESTS**. The productive funds amounted to \$16,152,835, and the income to \$1,627,527. The library contained about 1,000,000 volumes. The president was Arthur T. Hadley, LL.D.

YELLOW FEVER. See **TROPICAL MEDICINE.**

YOUNG MEN'S CHRISTIAN ASSOCIATION, INTERNATIONAL COMMITTEE OF. An organization formed in 1883 for the promotion of Association work in North America, with headquarters at 124 East Twenty-eighth Street, New York City. The committee consists of 69 representative Christian laymen, and it employs 111 executive, traveling, and office secretaries in the home field, and 140 secretaries in the foreign field in Asia, Africa, Latin America, and eastern Europe. In 1915 there were 2583 associations in North America with a total membership of 620,799. They occupy 759 buildings, valued at \$77,483,448, their aggregate property is worth about \$100,000,000, and expenditures (including foreign department) for 1915 were \$14,315,935. These local associations employ 4077 general secretaries and other paid officials. They enrolled 83,771 young men in evening educational classes, 447,351 in physical training, and 163,833 in Bible classes. Employment was found for 53,257 in 1915. The new buildings opened in 1915 cost \$8,663,171. The more notable of these include: Brooklyn "Central" (\$1,500,000); New York "Bronx Union"

(\$460,000); New York "Bowery Branch" (\$400,000); Association College, Chicago (\$300,000); and buildings at Youngstown, Ohio (\$327,000); Watertown, N. Y. (\$300,000); Hartford, Conn. (\$294,271); Grand Rapids, Mich. (\$265,000); Canton, Ohio (\$244,000). At the end of 1915 there was \$6,165,345 pledged for other new buildings, including the Men's Hotel, Chicago (\$1,300,000), and buildings at Rochester, N. Y. (\$600,000), and Cincinnati, Ohio (\$500,000). In the foreign field there were buildings completed or in course of construction at Tokyo, and Yokohama, Japan; Shanghai, Canton, and Foochow, China; Calcutta, India; Manila, P. I.; Havana, Cuba; Constantinople, Turkey. The officers of the International Committee include the following: Chairman, Alfred E. Marling; treasurer, B. H. Fancher; general secretary, John R. Mott. *Association Men* is an official monthly magazine of the organization.

YOUNG WOMEN'S CHRISTIAN ASSOCIATION, NATIONAL BOARD OF. For the year ending June, 1915, there were 245 local associations under the National Board with a total membership of 272,930, and 1584 employed workers. The associations having organized religious departments were 211; educational departments, 197; physical department, 197; girls' work department, 138; employment bureaus, 137. The total value of all the buildings owned in 1914-15 was \$9,162,147, and expenditures of all associations for the year were \$4,990,031. The receipts of the National Board were \$304,039. The National Board also controls 721 student associations with 65,129 members, and 13 county associations with 4246 members, making a grand total of 979 associations and 342,305 members. In the United States the National Board in 1915 conducted 15 city, student, and county conferences, and eight industrial or high school councils in which 5470 young women participated. The National Board carried on its work also in India, China, Japan, Turkey, and South America under the direction of 37 foreign secretaries. The headquarters of the National Board are at 600 Lexington Avenue, New York City, and a National Training School is conducted at 135 East 52nd Street, New York City, for training young women for association work. Its official publication is *The Association Monthly*. The officers for 1915 were as follows: President, Mrs. Robert E. Speer; first vice-president, Mrs. James S. Cushman; second vice-president, Mrs. William W. Rossiter; chairman of executive committee, Mrs. John French; secretary, Mrs. Thomas S. Gladding; treasurer, Mrs. Samuel J. Broadwell. Miss Mabel Cratty is the general secretary.

YUAN SHI-KAI. See CHINA, *History*.

YUKON. A territory of the Dominion of Canada, organized June 13, 1898. The area is 207,076 square miles, nearly four times as large as Alabama. Population at the 1911 census, 8512. The capital is Dawson, with (1911) 3013 inhabitants. The territory is administered by a commissioner; there is a legislative council of 10 members. Commissioner in 1915, George Black; gold commissioner and crown timber and land agent, George P. Mackenzie. See CANADA.

ZANZIBAR. A British insular protectorate off the coast of German East Africa. It consists of Zanzibar Island (640 square miles), Pemba Island (380 square miles), and several islets. Population, about 199,000, mostly Mohammedan. In 1913 the birth rate was 15.1, and the

death rate, 22.1. The port of Zanzibar is one of the best in Africa, and is a centre of trade with the mainland and with Arabia and India. The principal industry is clove culture, to which about 60,000 acres are devoted, yielding the bulk of the world's supply. About 45,000 acres are under coconuts. In 1913, imports and exports were valued at £1,103,348 and £1,048,866 respectively; in 1914, £763,405 and £814,952. Principal exports in 1913: cloves, £412,547; copra, £216,841; piece goods, £85,149; specie, £58,698; ivory, £39,856; rice, £24,386. A light railway extends from the town of Zanzibar seven miles to Bububu. Revenue and expenditure in 1913, £275,126 and £248,356; debt, Dec. 31, 1913, £100,000; sinking fund, £34,644. The Sultan is Seyyid Khalifa bin Harub, born 1879, succeeded on the abdication of his brother-in-law in 1911. There is a British agent and consul-general.

In May the Sultan of Zanzibar, in addressing a letter to the Lewali of Mombasa and the Mohammedans of East Africa, urged them to maintain their loyalty to the British, who had always respected their religion, freedom, and rights, and not to change their allegiance to Germany.

ZEPPELIN AIRSHIPS. See AERONAUTICS; MILITARY PROGRESS; and WAR OF THE NATIONS.

ZINC. The production of primary spelter and domestic ores in 1914 was 343,418 short tons, valued at \$35,028,636. The total production of spelter from both domestic and foreign ores in 1914 was the largest in the history of the zinc smelting industry in the United States, or 353,049 tons, compared with 346,676 tons in 1913. The domestic consumption was below the normal. But the war in Europe, which resulted in practically cutting the Allies off from their previous supplies of spelter, led to large exports from the United States. These amounted to 73,542 tons during the latter half of the year. Missouri produced the largest quantity in 1914, or 105,994 tons. In New Jersey were produced 74,353 tons, and in Montana, 55,790 tons. See also METALLURGY.

ZOÖLOGY. An important zoölogical expedition to the Belgian Congo started in 1909 from the American Museum of Natural History, and returned in 1915. A large number of species of animals were collected, what was probably the most important being skins of the *Okapi*, with notes and sketches for mounting habitat groups of this rare animal. A young *Okapi* was caught, but did not survive the journey to the United States.

A noteworthy book of the year was Conklin's *Heredity and Environment in the Evolution of Man*.

PROTOZOA. Calkins described a new gregarine which he found in the intestine of an annelid and named *Microteniella*, because of the tænia like character of the body. There was a single large cell corresponding to the scolex, with a string of small cells attached to it. Calkins found that *Didinium* encysts for purposes of production or reorganization but not for protection. This encystment for reorganization occurs at regular intervals, which can often be predicted two to four days in advance, because of reduced activity in feeding and dividing. Woodruff and Erdmann found in *Paramacium* (see YEAR BOOK for 1914) that a periodic reconstitution of the nucleus occurs without conjugation. This, Calkins thinks, demonstrates that either conjugation or endomixis must appear at regular in-

tervals and thus that protoplasm is not even "potentially" immortal.

Minchin and Thompson published an elaborate report of observations on the life history of *Trypanosoma lewisi* found in the rat, especially that part of its life cycle which occurs in the flea. Only a few of those taken into the flea live, and these change their form of movement probably because of the osmotic changes in the medium. About six hours after infection they enter cells of the stomach epithelium and multiply. Finally they assume the long "crithomorphie" phase and pass to the rectum. Here they pass into the small "crithidial" phase and multiply by transverse division. Infection of the rat is by eating fleas, or by licking from its fur, feces cast off by infected fleas.

PLATYHELMINTHES. Wilhelmi found in *Dendrocaelum lacteum* a sucking groove located near the anterior end of the pharynx. This is thrown against an animal such as a *Daphnia* and the prey drawn back into the pharynx. He saw a *Planaria* take a *Daphnia* away from a *Hydra*, the *Planaria* apparently not being affected by the thread cells.

MacCollum found trematodes adhering in large numbers to the gills of angel and butterfly fish in the New York Aquarium, causing the deaths of many of these fishes. The eggs are attached to the gills by filaments and develop directly into new individuals. Linton stated, also, that in the trematodes which he found on invertebrates at Woods Hole the redia stage is omitted.

FISH. Mast experimented on color changes in flounders and found that there was a considerable amount of individual variation in the extent of these changes, being very rapid and accurate in some. There was no imitation of pattern, but was of colors, except for reds. The organs involved are chromatophores and iridocytes, the latter containing guanin. The important receptors of stimulation are the eyes, the reaction not following a change of background if the animal is blinded. A fish will select a background which most nearly corresponds with its own color, and while this is probably protective, there is no direct evidence in favor of this assumption. As far as shade and color are concerned, it would appear that vision in fishes is essentially the same as in man.

The association of the young of various fish with jelly fish, such as *Cyanea*, has been interpreted as symbiosis. Scheuring, however, found reason to doubt this interpretation, and his own observations on *Carynx* indicated that the fish largely lives on the eggs and tentacles of the medusa. Thus the relation is really one of parasitism. Since the fish eat the tentacles they cannot be affected by thread cells, and it is probable that their surface epithelium is too hard to be affected by these threads. Young fish will hide for shelter under any floating object such as seaweed, and the habit of hiding under medusæ is a development of this habit. Shelford and Powers studied the reactions of herring and other marine fishes and found them extremely sensitive in their reactions to temperature and chemical stimuli. In this way they can have no difficulty in detecting the position of large rivers when hundreds of miles from shore, and can direct their movements accordingly. If this be true we do not need to appeal to any complex instinct to explain the return of the fish to the

rivers. They probably do not go so very far from the river where they were born and are able to find their way back by their reaction to delicate stimuli. Loeb stated that experiments indicate no effects produced by darkness on the developing eyes of fish, and hence decided that blind fish and other blind animals owe their loss of eyes to a mutation, and not to any effect of the darkness on the animal.

Townsend figured a *Remora* attached to the bottom of a pail which when lifted by the tail held up pail and water, weighing in all 24 pounds.

A *Remora* attached to a string was allowed to fasten to a 15-pound sea turtle, which it did with sufficient firmness to allow the turtle to be drawn to the surface of the water by the string.

AMPHIBIA. Shipley and Wislocki described the poison glands of *Bufo agui*. The large parotoid glands are a part of the skin and come away with it in dissections. The secretion is of two sorts; in the centre of the gland is a granular material which is the really poisonous part, while "epinephrin" content is a clear liquid near the margin. When stimulated the lumen of the duct is opened by muscular contraction, and the contained liquid spurted to some distance by other muscle contractions. After discharge the gland does not refill but disappears, and its place is taken by other glands which are present in a very immature condition.

REPTILIA. Winton stated that observations on the stomach contents of the horned lizard showed that they eat large numbers of noxious insects and have, therefore, about the same economic importance as the Northern toad.

CRUSTACEA. Potts described the Rhizocephalan genus *Thompsonia*, a parasite on the crustacean *Synalpheus*. Numerous external sacs appear on the outside of the host, but these are all parts of one much branching individual, instead of separate individuals as is generally supposed. *Sacculina* inhibits the molting process of the host, but *Thompsonia* does not, and in fact can reach the surface only if the host molts. There was no observable effect produced on the host. Potts could find no trace of a testis and thinks that in this genus parthenogenesis is the only mode of reproduction. Potts also described *Haplocarcinus*, a gall-forming crab living on the corals in Torres Straits. After impregnation the female remains in one place on the coral, which eventually surrounds her with delicate walls, thus enclosing her in a compartment. A respiratory passage is left through which water currents go. The male was described for the first time in this paper, though only one specimen was seen. It is smaller than the female, and is probably free living, fertilizing the female just before the gall closes.

INSECTS. Von Natzniae studied insect communities from the point of view of their ontogeny. When in the spring the female of a colonial form makes her solitary nest, she illustrates, in his opinion, the original solitary character of the colony. This phylogenetic phase is represented by the solitary forms, where the female does not live to see her offspring. Species of *Halicetus* illustrate the next stage, for here under specially favorable conditions, the female does see her offspring. Suppose that some of these young females see the still open combs, their instincts are aroused and they begin to assist the mother in caring for the young.

Phylogenetically this must have happened in the past, and thus led to the condition we now find in the colonial bees. Swarming of bees, like asexual reproduction in corals, has no phylogenetic significance, but arose late in the history of the race. The termites, where the males do some of the work of the colony, are more nearly in the phylogenetic line than are the bees. Geipel studied the anatomy of the light organs of tropical fireflies, using *Pyrophorus noctiluca* and *Photinus marginellatus* from Brazil, and *Luciola africana* from West Africa. In the last two species the light organs are in the last abdominal somites. His general conclusion was that the light organs are unicellular glands, and in the absence of ducts the secretion is burned *in situ*. Oxygen is brought to the gland through the trachea. Smith found that in *Stylops mellita*, while the male is apparently functional and retains his mating instincts, copulation probably does not occur and reproduction is by parthenogenesis. Bryk described a "monogamous" butterfly, *Parnassius* or *Kailasius*, in which at the hinder part of the abdomen is a pocket which at the time of copulation is filled with a secretion which hardens and prevents the entrance of other spermatozoa. This produces a necessary monogamy and ensures pure breeding. A new malarial mosquito, *Myzomyia febrifera*, has been described by Banks from the Philippines.

GENETICS. Genetics has developed into so extremely technical a subject that the zoölogist who is not working especially along this line finds difficulty in even reading the literature. To remedy this difficulty Morgan, with the coöperation of Sturtevant, Muller, and Bridges, published *The Mechanism of Mendelian Heredity*, in which are summarized what seem to them the most important results thus far obtained. The authors believe in the chromosomal theory of heredity, and in the case of *Drosophila* even go so far as to correlate four groups of characters, each with a definite pair of chromosomes, and to plot on the chromosome the relative location of factors. They state, however, their belief that the observed results could be explained without reference to the chromosomes.

In reply to criticisms directed against the factor hypothesis the authors admit that even among geneticists the terms "unit factor" and "unit character" have not always been properly employed. They define a "unit factor" as something in the germ cell which is able to modify the adult structure. A change in the factor may produce several changes in the adult, and the mistake is often made of seizing upon the most evident of these and calling it a "unit character." A single factor may have several effects and a single character may depend on the action of several factors. "The attack on the unit character hypothesis fails as soon as it is recognized that a single factor has not one but many effects." Characters superficially alike may be products of different factors.

The authors regard the theory of multiple allelomorphs, according to which a character may be allelomorphic to any one of several other characters, as preferable to Bateson's "presence and absence" hypothesis. (See YEAR BOOK for 1907, article BIOLOGY.) They consider that Weismann's theory of heredity in so far as it assumes a segregation of inherited materials in the chromosomes in the reduction division of sex cells is in agreement with Mendelian results.

The work of Morgan and his students has brought to light two processes known as "crossing over" and "linkage." The former refers to a condition where when a group of characters, A, B, C, D, belonging to one parent, meets with another group, a, b, c, d, in the other, the offspring shows different combinations, as A, b, C, d, etc. The latter refers to cases where two characters remain connected and do not separate as they should be on a strictly Mendelian basis. Bridges studied these phenomena in *Drosophila*, and found that the amount of linkage varies with successive broods, so that the number of the brood should be taken into consideration in comparing the amount of linkage in different animals.

Breeding experiments with *Drosophila* continued to develop new mutations and new factors were brought to light. MacDowell found a number of "restricting" factors which he thought were responsible for the non-appearance in normal flies of extra bristles which occasionally appear as abnormalities. These extra bristles he thought must have been present in the ancestral condition, but do not normally appear now because of the restricting factors. Stark found, also, new groups of "lethal" factors.

Phillips, working with ducks and pheasants, found that in these wild forms the characters do not "mendelize" as they do in domesticated forms. In wild races, also, there is little evidence for the presence of sex-linked characters.

Castle and Hadley thought that their results on crossing "English pattern" male rabbit with Belgian hare female, indicated that the gametes are not "pure" as stated by the Mendelians, but might vary in quality in passing from father to son, in this case increasing in the amount of pigment present.

Newman studied the hereditary characters of hybrid fish. He decided that success in producing hybrid development is not correlated with nearness of relationship but with specific characters of the germ cells, of which the yolk composition is the most important. Loeb had stated that in hybrids the spermatozoön merely initiates development, while the heredity of the embryo is purely maternal. Newman decided that there is a true fertilization, and not, therefore, a parthenogenesis as Loeb thought, but a case of dominance of the female over the male cell.

The publication of a new journal, *Genetics*, for papers in heredity was announced, the first number to appear in January, 1916.

PURE LINES. Earlier work of Johannsen on beans and Hanel on *Hydra* seemed to indicate that while a "population" is composed of diverse races which can be isolated by selection, selection of extreme variants within the race does not modify the mean of the descendants. If this were true, it would mean that natural selection has a very limited power to produce new species. Hanel's results were questioned by Pearson, who made a statistical examination of her data. Lashley in 1915 attempted a statistical study of the inheritance of tentacle number in budding hydra. He was unable, however, to reach any very definite conclusion as to the effect of selection within a pure line. Pearl and Surface report no effect produced in the pure line by selection of variants in oats for a period of three years. Castle, on the other hand, is positive that in rats and rabbits he can, by selecting

extreme variants of coat color, carry the mean of the race much beyond its original limits.

At the Maine Agricultural Experiment Station a series of experiments have been conducted since 1908 in the effort to improve by selection the winter egg laying capacity of fowls. Pearl stated that the results obtained up to 1915 indicate a certain amount of improvement in the average production, but there is no reason to think this is anything but the elimination of the lower grades. The better grades are no better than at the beginning. Castle, however, criticised this work of Pearl's on the ground that too few individuals were studied, and stated that with hooded rats he was able by selection of extreme variations of the "hood" to produce forms far beyond anything present in the beginning—results indicating that the factorial basis of this character undergoes quantitative variation.

FERTILIZATION. Loeb believes that the formation of a cortical membrane is essential in order that an egg shall begin development. In the sea urchin egg he found that exposure to the light of a quartz lamp produced such a membrane, and under proper conditions these eggs would continue to develop. Lille, whose fertilizin theory (see YEAR BOOK for 1914) had been criticised by Loeb, returned to a defense of his position that all agencies initiating development do so by the activation of an ovogenous substance which he calls fertilizin. An agglutination usually accompanies this process but this is not essential, for the egg may be fertilized by one spermatozoön. Lille thought that the motility of the spermatozoön is not important in fertilization for the spermatozoön really enters the egg after development is initiated, the latter being produced by some substance given off by the spermatozoön. Solutions of spermatozoa lose their fertilizing power on standing because they lose this material, rather than through any loss of motility. Glaser stated that in the *Arbacia*, while only one spermatozoön actually enters the egg, certain preliminary stages such as the formation of a membrane, necessitate the mass action of many spermatozoa. In this sense, one spermatozoön is not enough for fertilization.

SEX DETERMINATION. That sex may be determined by nutritive conditions before birth there is no conclusive evidence to show. Many have adopted a chromosomal explanation. Papanicolaou, in guinea pigs, described three factors which determine sex: (1) the sex tendency of the father; and (2) that of the mother, transmission of these being "criss cross"; while a third factor is confined to the female, and is changed from litter to litter. Morgan thought that in aphids, sex is determined by chromosomal conditions, but did not eliminate the possibility that external conditions may modify the sex ratio. "Opponents and advocates of the chromosome theory of sex determination have often failed to realize that 'factor for sex' is not used in any absolute sense, but as the best known or most usual factor difference." Doncaster discussed the whole question in a book on *The Determination of Sex*, in which he pointed out that by it we often mean the possible control of sex by human agencies while the real problem is to discover what actually determines sex, even though this may be entirely beyond human control. There is evidence of the existence of male- and of female-

producing eggs, and in other cases evidence that sex is determined at the time of fertilization by the spermatozoön. In some cases, however, the expected result does not follow, and in the frog there is some reason to think that the sex is affected by external conditions. Doncaster thought that a possible escape from these conflicting conclusions could be reached if we assume that sex is a result of a reciprocal action between an inherited factor and the physiological condition of the organism as a whole. A particular chromosome provides only one side of the reciprocal reaction. In insects the chromosomes of the two sexes are apparently quite unlike, so that the addition of a particular one may determine sex. In the frog, however, it looks as if the chromosomes of the two sexes are alike and here the physiological condition of the organism may, by altering the reaction between chromosomes and cell substances, change an egg that would have given rise to one sex into the other.

Regarding the part which the sex organs may play in producing secondary sex characters, Geoffrey Smith concluded (see YEAR BOOK for 1913) that when a parasitized male crab assumes secondary female sex characters it is because of metabolic changes set up by the parasite having the same effect on the organism as the developing ovary would have. He continued this study on a bee, *Andrena nigroaenea*, parasitized by a *Stylops*. Here, the parasite inhibited the development of the ovaries, but in no way modified the process of testes formation in the male. The female seemed to lose the instinct to collect pollen. Pearl stated that in a cow which had ceased to show signs of oestrus and had developed male characters, the *corpus luteum* had disappeared from her ovary. In consequence he suggested that possibly the *corpus luteum* is one of the chief ovarian agents in mammals in maintaining "femaleness."

Whitney had stated that a change of food of *Hydatina* would change the line from a female to a male-producing one. This experiment he repeated on specimens from England with like results. When fed on *Polytoma* female-producing young result, while when fed on *Chlamydomonas* male-producing daughters appear.

CHROMOSOMES. That chromosomes are carriers of hereditary material is generally accepted as a working hypothesis. Morgan, in *Drosophila*, grouped characters he had isolated into four classes. The chromosomes of this species may be arranged in four classes, and relative sizes of the chromosome groups correspond roughly with relative sizes of these groups of characters. The mode of inheritance of these characters harmonizes with the assumption of location in these chromosomes.

In opposition to this theory, a picturesque conclusion is that of Child—"the attempts to connect particular factors with particular chromosomes or parts of chromosomes are not at present, properly speaking, scientific hypotheses."

Zeleny found that measurements of spermatozoa in animals where accessory chromosomes are present, when treated statistically, gave bimodal curves, indicating a measurably greater amount of chromatin in some than in others, which is probably the accessory chromosome.

ZULULAND. A territory of Natal (q.v.). See SOUTH AFRICA, UNION OF, for area, etc.

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